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Proteon to support SNA on internets

By Maureen Molloy
Staff Writer

WESTBOROUGH, Mass. — Proteon, Inc. will roll out software and hardware enhancements for its bridge/routers over the next 18 months that will enable customers to better integrate IBM Systems Network Architecture traffic into LAN internet backbones.

Proteon, which is scheduled to announce its long-term plans today, said it will initially support IBM local-area network and SNA terminal traffic by encapsulating that data in Transmission Control Protocol/Internet Protocol packets. This is the same tack Cisco Systems, Inc. and Wellfleet Communications, Inc. are taking.

The company does not, however, plan to follow Cisco's ultimate strategy of routing SNA in native mode by making its routers emulate IBM PU Type 4 devices, which are front-end processors.

"Our strategy is to tie together the large SNA installed base that is now migrating to LANs," said Nathan Kalowski, Proteon's vice-president of marketing. "Our aim is to offer users a migration path to the PC LAN while they stick with their existing applications."

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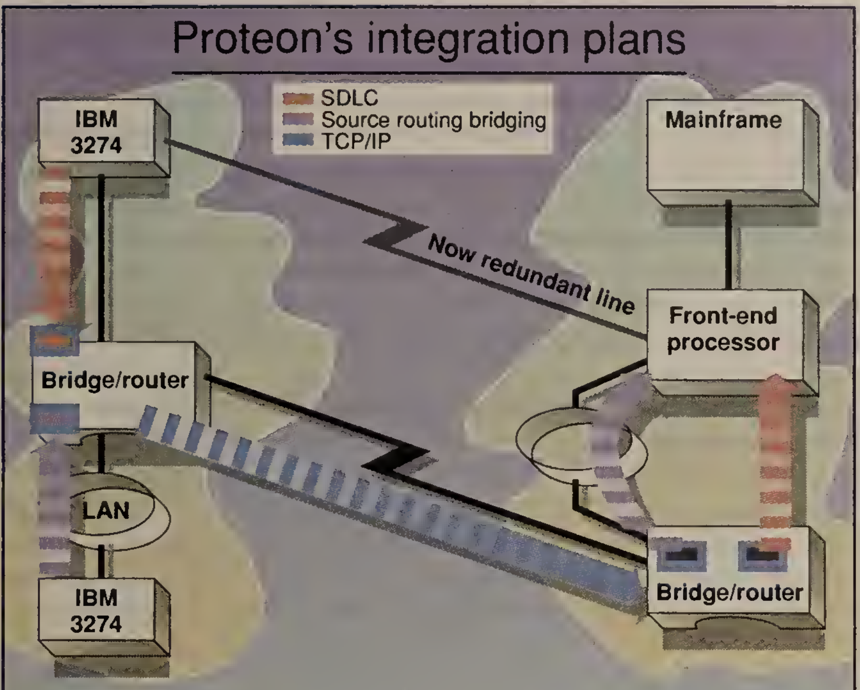
Proteon's integration plans



Proteon bridge/routers will integrate IBM LAN and SNA terminal traffic on the same backbone by encapsulating both types of traffic in TCP/IP packets. Subsequent releases will bridge Token-Ring and Ethernet networks, and make it possible to pass SDLC traffic directly into an SNA front-end processor across a token ring.

GRAPHIC BY SUSAN J. CHAMPENEY
SOURCE: PROTEON, INC., WESTBOROUGH, MASS.

Users benchmark nets to evaluate strategic worth

By Wayne Eckerson
Senior Editor

Fueled by a ground swell of interest in improving quality, a growing number of leading U.S. companies are looking for industry benchmarks against which they can measure network performance and more accurately demonstrate the value of networking to upper management.

But rather than commission studies or use formal benchmarking services to find out how they stack up, these companies are seeking out one another to compare network performance. Through peer-to-peer benchmarking, the companies hope to discover new ways to reduce network costs and improve the quality of customer service.

But judging one company's network against another is not always easy. Different firms don't collect the same kinds of data, and if they do, they may not ma-

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RBHCs receive green light for info services

Despite reservations, judge lifts RBHC ban on info services, orders stay pending appeals court review.

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — U.S. District Court Judge Harold Greene last week ruled that the RBHCs should be allowed to enter the information services market but said he had enough grave reservations about the decision to suspend it until appeals are heard on the case.

If removal of the restriction is upheld in court, the regional Bell holding companies will be allowed to provide services such as electronic yellow pages, data base retrieval, protocol processing and, potentially, video programming.

The ruling reverses Greene's 1987 decision to continue to prohibit the RBHCs from providing information services, a ruling a federal appeals court last year ordered him to reexamine.

MCI Communications Corp. said it will appeal Greene's new ruling, while other parties, including the American Newspaper Publisher's Association, also threatened court action.

Although Greene has ostensibly opened the door for the RBHCs to enter information services, it is unclear how long they will have to wait to launch offerings. Besides appeals, Congress may also get involved.

The Senate has already passed a bill that would allow the RBHCs to manufacture telephone equipment, one of the other two bans imposed by the Consent Decree. Rep. Edward Markey (D-Mass.)

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The FCC's full plate

Rulings to be issued on Aug. 1 will address:

- ☐ AT&T Tariff 15
- ☐ Lessening regulation of AT&T
- ☐ 800 number portability
- ☐ Access charge structure

See story, page 2

Users reveal net gains via frame relay

By Paul Desmond
Senior Editor

Early frame relay users are reporting dramatic gains in network bandwidth utilization and, in some cases, response time improvements. But they said the nascent technology has also thrown them a few curves.

Two users — Convex Computer Corp. and Motorola, Inc. — said bandwidth utilization on router networks shot up at least 60% when frame relay was employed. Motorola said its tests also revealed end-user response time improvements of over 50%.

A third user — the California State University (CSU) system — said the use of frame relay on its routers provided modest response time improvements in some cases. Convex Computer also said response time gains were not significant.

All three users, however, said

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NETLINE

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GERMANS SET TO PARE domestic, int'l private-line rates, eliminate restrictions on private, public nets. Page 2.

MICROWAVE USER GROUPS assail PCN America report on feasibility of bandwidth sharing. Page 2.

IS MANAGERS IDENTIFY hurdles to redeploying applications on LANs in corporate downsizing efforts. Page 3.

DOS MAINTAINS HOLD on client workstations attached to LANs. Page 3.

IBM OUTLINES long-term vision for SystemView in management applications. Page 13.

THREE VENDORS shed light on wireless LAN alternatives. Page 17.

NEWSPAPER

FEATURE

High-speed era dawning for packet-switched nets

By Kris Herbst
Special to Network World

Packet networks are entering their second era, one in which data will be moved faster and less expensively than ever before. This time, there's a good chance packet switching will supplant circuit switching, which has dominated data networking for the past decade.

The first era of packet switching was launched in the 1970s with the pioneer public packet net, the Advanced Research Projects Agency Network (ARPANET). But that period faded, largely because pure circuit-switched T-1 links were less expensive for voice/data networks.

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Germany to ease private net regulation, lower costs

Private-line prices to fall; restrictions regarding private and public network links will be relaxed.

By Barton Crockett
Senior Editor

BONN, Germany — Germany will dramatically reduce domestic and international private-line prices, as well as eliminate most of its restrictions concerning the linking of private and public networks, a top government official told *Network World* last week.

Peter Bross, head of regulatory affairs at Germany's Ministry of Posts and Telecommunications here, said he expects new regulations to be adopted within six months that will allow users for the first time to route voice traffic between multiple private lines or between private and public nets without paying volume-sensitive tariffs.

Currently, Germany's monopoly carrier, Deutsche Bundespost (DBP) Telekom levies a volume-sensitive charge on private lines used to carry traffic among multiple sites or used to dump traffic into the public network. These tariffs negate the cost advantage of private voice networks, Bross said.

U.S. companies are eager to see this restriction eliminated. In addition to making private voice networks more economical, the change will make it cost-effective to route international calls from employees' homes via corporate private networks — a popular

(continued on page 4)

Microwave users balk at frequency-sharing report

Doubt findings that PCNs won't cause interference.

By Bob Wallace
Senior Editor

WASHINGTON, D.C. — In what could be the beginning of a protracted battle, two microwave user organizations last week attacked a report that concluded that radio frequencies can be shared by microwave networks and emerging wireless communications services.

The Houston Area Microwave Users Group (HAMUG) and the American Petroleum Institute (API) claimed that frequency sharing without interference is impossible, while PCN America, Inc. stated in its report that sharing is possible under certain conditions.

PCN America, a voice personal communications network (PCN) operator, filed its report after the nation's first frequency-sharing trials in Houston and Orlando, Fla., in which users and PCN America worked together to determine whether transmissions over microwave links were affected by PCN America's signals. PCN wireless nets use low-power transmitters in small cells, while standard cellular systems use high-power transmitters in large cells.

PCN America admitted in its report that its network interfered with transmissions over microwave links operating in the 2-GHz

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FCC to rule on numerous critical long-distance issues

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — The Federal Communications Commission will rule this Thursday on four major proceedings that will significantly impact the way in which long-distance carriers are regulated.

The FCC is scheduled to decide the lawfulness of customer-specific discounts offered under AT&T's Tariff 15 and determine AT&T's level of dominance so it can decide whether to relax regulation of the carrier. It will also formulate rules to spur local carriers to implement the technology needed to make 800 numbers portable and determine how access charges will be structured.

Although there were still a number of questions and details to be resolved, several sources last week said they expect the FCC to vote to relax regulation as part of its proceeding on AT&T dominance. However, the agency is also expected to reject AT&T's Tariff 15 deals.

This is the first comprehensive effort by the FCC to address a number of lingering questions about competition and regulation of the long-distance industry that

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Briefs

MCI goes live with SONET. MCI Communications Corp. last week cut over a Synchronous Optical Network (SONET) system on a 150-mile fiber route running from Dallas to Longview, Texas. The SONET system, which is based on Northern Telecom, Inc. SONET equipment, operates at 2.4G bit/sec and can support as many as 32,256 simultaneous calls on its 48 channels.

SONET is a fiber-based transmission architecture for supporting gigabit transmission speeds and is expected to be the infrastructure carriers will use for the next several decades. MCI said the system will enable it to offer an array of bandwidth-on-demand services but declined to discuss any planned services or availability dates. The implementation follows the successful completion of a 10-month test by MCI and Northern Telecom.

IBM protests Treasury contract. IBM's Federal Sector Division last week filed a protest in an effort to overturn the Department of the Treasury's recent $1.4 billion contract award to AT&T for an office automation system based on local-area networks linked via a wide-area backbone ("AT&T wins pact to build nat'l LAN internet for IRS," *NW,* July 22). IBM argued that AT&T's bid was more than half a billion dollars above its offer. IBM filed its protest with the General Services Administration Board of Contract Appeals.

Wired and wireless. Motorola, Inc.'s Radio-Telephone Systems Group and Ungermann-Bass, Inc. last week signed an agreement under which the companies will jointly market and work to integrate their two flagship products, Motorola's Altair wireless local-area network and Ungermann-Bass' Access/One smart wiring hub. Mil Ovan, senior marketing manager at Motorola, based in Arlington Heights, Ill., said the companies will eventually offer the products in a bundled package.

To Russia, with phone lines. AT&T last week asked the Federal Communications Commission for permission to activate 90 satellite circuits for telephone service to the Soviet Union. The carrier said 91 out of every 100 calls to the USSR are blocked because the 67 phone circuits it currently runs into the country are not enough. The 90 circuits requested would be routed via Intersputnik, a satellite system owned by Cuba, Eastern European countries, North Korea and the Soviet Union. The U.S. was allocated use of these circuits by the International Telecommunications Satellite Organization in June. The FCC, however, is weighing AT&T's request to use these circuits against requests from other carriers, including IDB Communications Group and TRT/FTC Communications, Inc.

DEC, Unisys announce job cuts. Digital Equipment Corp. and Unisys Corp. last week announced massive charges against quarterly earnings to cover across-the-board job cuts.

DEC said it took a $1.1 billion charge against its fourth-quarter earnings for the period ended June 30. That left the company with a $871.3 million net loss for the quarter and a $256.7 million net loss for the year. Analysts said the charge will cover the elimination of about 10,000 jobs. DEC, which has about 121,000 employees, has indicated it will lay off 2,000 employees this summer but did not offer specifics on further cuts.

Unisys took a special charge of $1.2 billion in its second fiscal quarter ended June 30, finishing with a quarterly loss of $1.3 billion. The company, which employs about 72,000, said it plans to cut its work force by 10,000 people this year.

IBM to unveil voice response unit. IBM is expected to announce this week new voice processing products, including its first internally developed interactive voice response unit, a high-capacity device based on Reduced Instruction Set Computer technology. IBM currently resells voice response units made by Syntellect, Inc. and a Personal System/2-based voice response unit made by InterVoice, Inc. of Richardson, Texas.

Poland plots public net upgrade. Northern Telecom, Inc. last week said Poland selected the equipment maker for a $120 million upgrade of the country's public net. An initial $5 million order will be for nine DMS-10 central office switches, which are scheduled to be installed this year. As part of the deal, Northern Telecom expects to begin manufacturing central office switches in Poland next year.

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IS workers meet, share notes on difficulty, viability of downsizing

By Timothy O'Brien
West Coast Bureau Chief

CHICAGO — Attendees at last week's Downsizing/Rightsizing Corporate Computing Conference here identified obstacles that threaten to slow or even stall corporate downsizing efforts.

Information systems (IS) managers said conference presentations reaffirmed their fears about the lack of available tools for redeploying applications on local-area networks, the difficulty of adapting staff skill sets to new technologies and the fact that downsizing may not actually save money.

"No one argues the concept anymore, but there is still a big gap in the downsizing story in terms of application development," said John Rymer, vice-president of Patricia Seybold's Office Computing Group.

Most IS managers said they now have upper management support for downsizing, which allowed many attendees to come ready with a specific project in mind. Even so, a multitude of issues was raised about the feasibility of moving beyond pilot projects.

Tools needed

One topic that surfaced repeatedly was the lack of tools for building distributed applications. "We're looking for tools since we have a need for an enormous amount of shared information to be used in distributed data bases and that also needs to be relayed back to the mainframe," said Pat Wilson, assistant director of development at Harris Methodist Health Services in Fort Worth, Texas.

According to Wilson, Harris' IS staff is searching for tools to build client/server applications that would run on departmental LANs in 12 affiliated hospitals. He said the company is not looking to replace the mainframe but rather to distribute processing loads on the best available platform.

Along the same lines, Levi Strauss & Co. in San Francisco is evaluating a plan to move a graphic design application now running on an IBM 3090 to a network of Unix processors.

"If it makes sense, we will reengineer the business plans to take advantage of the network," said Bob Mann, director of applications information technologies at Levi Strauss. "I feel strongly this is the right direction, but we must be pragmatic."

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DOS still head of the OS class for local nets

Last in a three-part series examining trends in desktop operating systems.

By Caryn Gillooly
Senior Editor

DOS is far and away the most popular client workstation operating system used in local-area networks today, and analysts predict it will remain so for at least the next five years, maybe beyond.

While the uncertainty of OS/2 is one factor contributing to DOS' success, analysts said the popularity of Microsoft Corp.'s Windows, as well as the decision by many organizations to standardize on DOS to support various network operating systems, will ensure that DOS continues to command the lion's share of the desktop operating system market.

As users move to client/server networks and applications, it becomes more important for LAN workstation operating systems to have increased functionality.

Sticking with DOS

OS/2, Unix and even Apple Computer, Inc.'s System 7 have more to offer the network user than DOS, such as multitasking ability, fewer memory constraints and inherent file and print services.

However, analysts said users will stick with DOS for the majority of their applications.

According to a study by International Data Corp. (IDC) in Framingham, Mass., 58% of today's personal computers are running DOS, compared with 10% running Unix and 9% running OS/2. IDC predicts that by 1995, although OS/2 use will have doubled to about 23%, DOS will still hold

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Networks Built on Experience

Microwave users balk at report

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band but termed the trial results positive. "In most instances, there was no interference to microwave systems even without the use [of the special equipment]," the PCN America report said.

However, to avoid interference in the future, PCN America said it would have to furnish its wireless system with special filtering equipment and power systems, restrict the size of cells in densely populated areas to 1,200 feet in diameter, and limit the number of users in those cells to 10 or 50.

"Based on the data collected in the Houston, Orlando and New York [tests], there will be no interference to any microwave link by a spread-spectrum PCN system employing adjustable notch filters and adaptive power control," the PCN America report said.

Based on its findings, PCN America urged the Federal Communications Commission to permit wireless communications operators to use the 2-GHz radio frequency. But energy and transportation users are against sharing the frequencies — which they have long used for their private microwave nets — with wireless communications operators.

In a report filed last week, HAMUG, an ad hoc group created to jointly conduct the Houston test with PCN America, challenged the company's claim that frequency sharing is workable. HAMUG is made up of members from three users groups, API, the Utilities Telecommunications Council and the American Association of Railroads.

"The PCN America spread-spectrum system will interfere with existing microwave systems," the report said. Interference will occur any time the PCN unit is within roughly 20 miles of a microwave antenna, HAMUG stated.

The HAMUG report also claimed that PCN America, which alone selected the location of its PCN transmitters and handsets for the test, situated them away from the microwave transmission path as well as behind tall buildings.

"When unobstructed sites [in the microwave transmission path] were used during handset testing, greatly increased interfering signals were received at the microwave receiver," the report said. "No effort was made by PCN America to determine the location of maximum interference at a test site."

With the test complete, many HAMUG members said there is little hope for frequency sharing. "The two cannot coexist without interference," said Rick Smith, a network manager with Texaco, Inc. in Bakersfield, Calif.

Asked what course of action he would recommend to his superiors, Smith said, "I would tell them that if we are forced to coexist that we need to make other arrangements. We're probably going to have to turn off the microwave and lease a line, or try and get a microwave system in a different band."

API, a national trade association representing 200 companies in the oil and gas industries, questioned the validity and accuracy of the PCN America report in comments filed with the FCC last week. The group requested that the FCC block PCN America's request to test its net until the interference issue could be resolved.

FCC Chief Engineer Tom Stanley, who has met with PCN America officials, called HAMUG members together here July 26 to hear what they had to say about the Houston and Orlando tests before deciding whether to let PCN America test its network.

"PCN America said the experiment worked and showed that some degree of sharing is possible," Stanley said. "We expect the users to say the test showed otherwise. The truth will be somewhere in the middle."

The FCC is expected to announce its decision in the next few weeks. ⧉

IS workers on downsizing

continued from page 3

As presenters outlined the few tools that are available and how to use them in client/server development, IS managers faced the question of how to reshape IS skills to work within the new setting.

"Of all the tools that are available, there either seems to be a lack of integration among them or they require experience that we don't yet have," explained Gary Gronert, manager of information resources at MTS Systems Corp., a Minneapolis-based maker of simulation and testing products.

Companies that appeared most successful in downsizing had built a project team that included the views of personal computer users but followed the experience and more formal methodology of mainframe application developers.

What is the best option?

Analysts at the conference said retraining mainframe programmers to work in new object-oriented programming environments can take at least a year and is not always the best option.

In some cases downsizing can lessen the programming load due to either the shortened development cycles or the use of customized off-the-shelf programs. As a result, some mainframe staffers are moving from coding to systems support of the new applications on the LANs.

"Companies shouldn't expect staff savings from moving applications to a client/server architecture since support needs to be as rigorous as it was on the mainframe," said Ralph Hubbard, president of Technology Management International, Inc., a Boston consultancy.

Even though one of downsizing's selling points has been cost savings, IS managers were wary about fulfilling those expectations since companies are trying to offer new products and services while reducing corporate budgets. ⧉

Germany to ease regulation

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option because of time zone differences.

"Anything that does away with interconnection problems [between private lines and public networks] is critical to users," said Philip Onstad, manager of international public policy with the International Communications Association. "That's something users are pushing me very, very hard to get in Germany."

Bross said he also expects the ministry by year end to order DBP Telekom to greatly reduce both domestic and international private-line tariffs. Although the size of reductions is still being debated, Bross said the price cuts are intended to make Germany's private-line tariffs more competitive.

DBP Telekom's international and domestic tariffs are among Europe's highest, even though the carrier has reduced international service prices by about 40% in recent years, Onstad said.

"A number of organizations either did not build headquarters in Germany or left Germany because of the telecommunications cost," he added.

Result of 1989 reforms

The ministry is making these changes to fully implement reforms approved by the German government in 1989, Bross said. These reforms increased competition in network equipment and value-added service markets but allowed DBP Telekom to retain its monopoly over fixed public switched voice service.

Bross said that over the past two years, the ministry has worked to more precisely define DBP Telekom's monopoly. This effort included publication of documents that say users are allowed to route private-line voice traffic into the public net for internal use without paying special tariffs. It also says that private-line prices should be based on provisioning costs.

According to Bross, the proposals have been commented on and should be formally accepted as German law within six months.

Taking its time

But Max Kunz, vice-chairman of the International Telecommunications Users Group in Geneva, said the carrier may implement the reforms more slowly than the ministry wants.

One indication of the depth of the dispute between the carrier and the regulator is the wrangling over private-line tariffs.

Bross said that in May DBP Telekom asked the ministry for permission to lower by about 40% tariffs for transatlantic private lines and domestic private lines longer than 1,000 km. The carrier also wanted to increase prices for private lines less than 10 km by as much as 100%.

The proposed increase was unacceptable, according to Bross. He added that much larger reductions will be needed, although the reductions for international private lines may be less than DBP Telekom proposed.

Meanwhile, U.S. users are ready to take advantage of the changes. Frederic Kunzi, Digital Equipment Corp.'s international transmission services manager, said the changes are causing his firm to consider extending its global, private voice net into Germany. ⧉

Corrections: The story "Frame relay steals show" (*NW,* July 22) misstated a Forrester Research, Inc. survey. Twenty-three of the 50 firms surveyed plan to implement frame relay within two years.

A recent chart titled "AT&T's Tariff 12 users" (*NW,* July 22) incorrectly listed National Data Corp. as the holder of Virtual Telecommunications Network Service Option 56. The option has been withdrawn. Also, Bridgestone/Firestone, Inc.'s deal, Option 33, is a three- to four-year deal worth $14 million to $18 million. We regret these errors.

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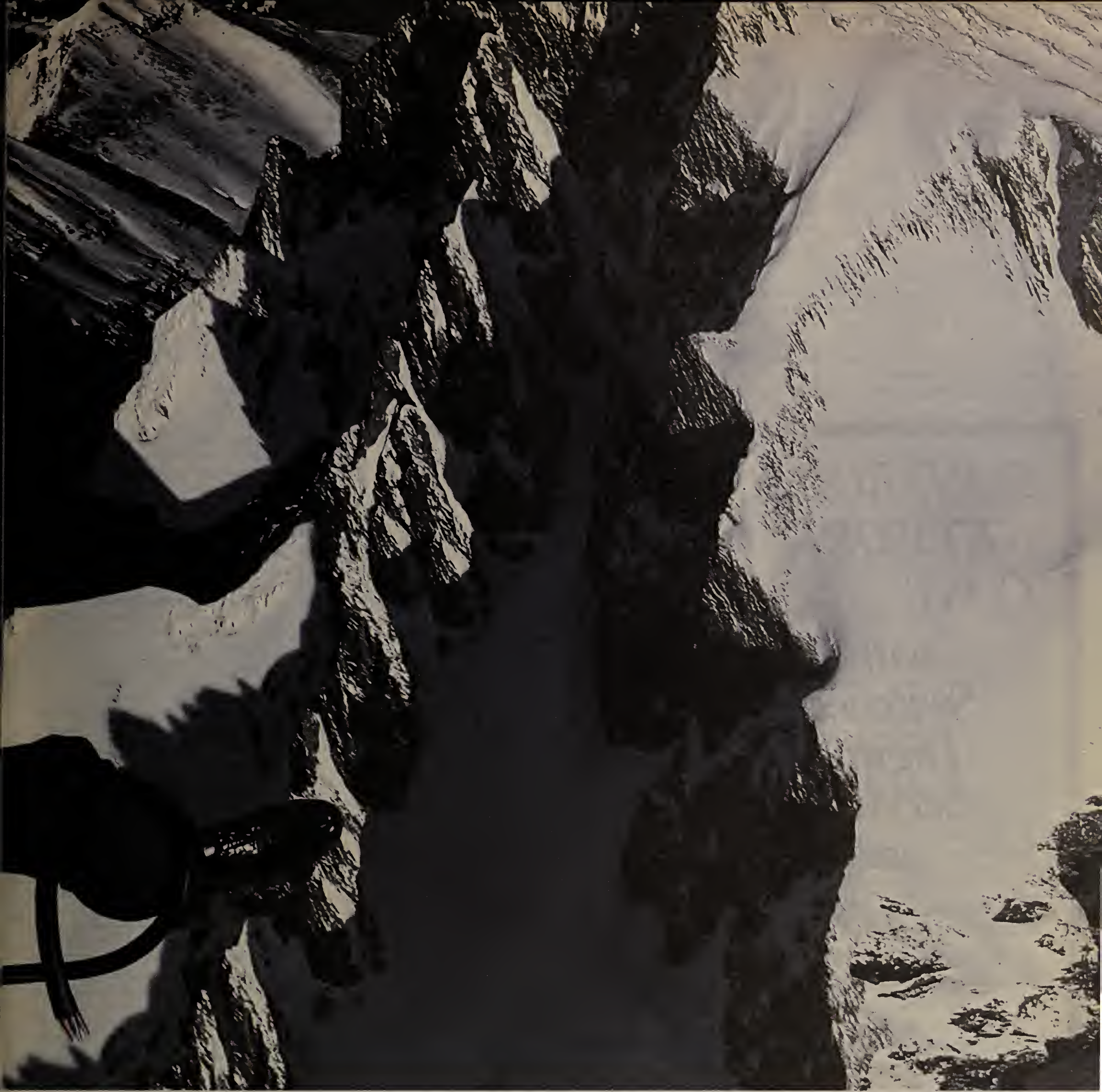

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Proteon to support SNA

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Products that will enable users to encapsulate IBM LAN and SNA terminal traffic for transport over the same LAN internetwork will be announced by year end, Kalowski said.

Although Proteon's bridge/routers currently support IBM's Source Routing Bridging protocol, offering the ability to encapsulate this LAN traffic in TCP/IP will overcome many of the deficiencies inherent in source routing.

Encapsulation, for example, enables end nodes to see a transmission path, or tunnel, as a point-to-point connection — a single hop. This eliminates the need to configure networks to abide by source routing's seven-hop restriction.

Routing TCP/IP packets instead of using source routing to bridge LANs also limits network overhead by doing away with the need to broadcast discovery packets to determine paths through a network. Routers can dynamically learn where stations are located and filter out unnecessary overhead traffic.

In addition, Proteon supports the Open Shortest Path First (OSPF) routing protocol, an emerging TCP/IP routing standard, which enables bridge/routers to route encapsulated traffic around failed network components, overcoming source routing's sensitivity to network failures.

"The original aim of source routing was to do a simple job of connecting a few LANs together," Kalowski said. "It was never intended to have the robustness of a protocol like IP, with its dynamic routing capabilities that allow you to build large nets."

SNA terminal support

To support IBM terminal traffic, Proteon will offer SDLC Relay, a software enhancement that will enable users to directly attach synchronous devices such as cluster controllers to a Proteon bridge/router.

The enhancement will support point-to-point Synchronous Data Link Control transmission between SNA devices by encapsulating SDLC frames in TCP/IP packets that are then routed using the OSPF protocol. Both IBM LAN traffic and SDLC terminal traffic can be supported on the same backbone.

Piggybacking SDLC traffic on LAN internetworks will reduce circuit costs by letting users disconnect the dedicated links currently used to support remote SDLC devices. At the mainframe site, however, the bridge/router will require direct SDLC connections into SNA front-end processors.

By year end, Proteon also plans to announce support for IBM's LAN Network Manager, a device which identifies faults associated with LAN hardware.

Next stage

Following these announcements, Proteon plans to add features in mid-1992 that will make it possible to integrate Ethernet, token-ring and other network environments as well as improve support for SDLC.

By adding support for the emerging Source Routing Transparent (SRT) IEEE standard that defines how to bridge token-ring and Ethernet LANs, Proteon will be able to transmit Network Basic I/O System packets throughout an internetwork.

SRT differentiates between Source Routing and non-Source Routing LAN traffic on a packet-by-packet basis, determines the destination address and then processes the packet accordingly.

SDLC support will be improved by adding a Serial/Token Ring Gateway to the bridge/router at the mainframe site. The gateway makes it possible to multiplex SDLC traffic into Logical Link Control frames and pass that traffic into the front-end processor through a token ring instead of having to use lower speed SDLC connections as required with SDLC Relay.

Rick Malone, a principal at Vertical Systems Group, a consultancy in Dedham, Mass., said Proteon is the first router vendor to use a token-ring gateway as a way to provide seamless internetworking of SNA traffic.

"It's a novel approach," Malone said. "If the [token-ring] gateway cuts down on the number of interfaces to the router and allows more sessions to be routed in IP packets, this could diminish the need for a PU 4 implementation."

Proteon will also, at this point in its product release plans, add network management support for the Open Systems Interconnection Common Management Information Protocol and improve NetView integration, eventually leading to direct NetView support.

Proteon calls its SNA integration plan a practical solution for users awaiting public specification of IBM's Advanced Peer-to-Peer Networking (APPN) network node.

APPN defines how devices can communicate as peers, as opposed to SNA's current hierarchical fashion. It also supports dynamic routing through an SNA net, instead of having to predefine every network route in Network Control Program and VTAM.

Proteon said it will support IBM's APPN strategy in the long term, but currently will not attempt to enable its bridge/routers to emulate front-end processors.

"We're interested in a pragmatic implementation that meets user needs today without preventing them from migrating to APPN in the future," Kalowski said. "When and if APPN arrives, users will need a software enhancement vs. a hardware throwaway." ☑

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PROMPTUS

INDUSTRY UPDATE

VENDOR STRATEGIES, MARKET TRENDS AND FINANCIALS

Worth Noting

> “Most of the frame relay service providers have found that, despite all the market hype, they are not getting [users] running to frame relay services. The folks that are in beta tests right now have two or three test sites, and they don’t have a long line of people waiting to try out frame relay networks.”

Jim Harrison
Program director
META Group
Westport, Conn.

People & Positions

Nynex Corp. last week named **Thomas Tauke,** former U.S. congressman (R-Iowa), to the newly created position of vice-president of government affairs. He was also named president of Nynex Government Affairs Co., a Nynex subsidiary that deals with federal agencies, including the Federal Communications Commission and Congress.

Tauke, a representative between 1979 and 1991, was coauthor of “The Telecommunications Services Act of 1989” as a member of the House Telecommunications and Finance Subcommittee. The bill was a precursor to legislation now being considered in Congress that could free Nynex and the other regional Bell holding companies from certain line-of-business rules.

Most recently, Tauke was a senior partner in the consultancy Tauke, Walgren & Associates in Washington, D.C. Tauke succeeds **Morrison Webb,** who was named vice-president and general counsel of New England Telephone and Telegraph Co., as head of Nynex Government Affairs. ◘

GDC exec maps out plan to spur reversal of misfortune

New gear to drive sales; controls keep costs low.

By Bob Brown
Senior Editor

MIDDLEBURY, Conn. — Two weeks after General DataComm Industries, Inc. (GDC) announced it would idle 190 workers, a top executive said the company will rely on product rollouts to revive revenue growth and institute cost cutting to improve its bottom line.

GDC recently disclosed plans to cut its work force of 1,900 employees by about 10% as part of a broad effort to reduce spending by around $10 million over the next 12 months.

In an interview with *Network World* last week, Ross Belson, GDC’s president and chief operating officer, attributed the need for a cost-cutting program to economic slowdowns in the U.S., Canada and parts of Europe.

The reduction measures are designed to bring GDC’s spending in line with revenue, which has held steady at about $200 million for the past three years, he said.

With close to half of the across-the-board job cuts coming in manufacturing, customers should not be affected by the work force reductions, Belson said. Improvements in manufacturing operations instituted in recent years will enable GDC to offset the staff cuts and maintain inventory levels without affecting product availability.

Staff reductions in GDC’s marketing and sales departments could result in some customers dealing with new account representatives, but such changes will be kept to a minimum, according to a GDC spokeswoman.

The firm will not resort to price cutting or special promotions to kick start otherwise flat revenues, the spokeswoman said.

While the job cuts will provide GDC with a short-term fix of its bottom line, the company’s long-term strategy is to generate revenue by expanding its presence in the local-area network interconnection market, Belson said.

GDC plans to roll out frame relay support on its Megamux multiplexers next year and deliver new router products sometime down the road, he added.

“What we are really focusing on here is a balanced approach,” Belson said. “On the one hand, we’ve got to continue to put a heavy focus on costs, but that is not the only answer. Ultimately, we’ve got to grow the bottom line by increasing revenues. So our thrust will be to introduce new products.”

(continued on page 10)

INDUSTRY BRIEFS

DSC shareholder files suit. DSC Communications Corp. recently said one of its shareholders filed a lawsuit against the firm, alleging DSC misrepresented the quality and reliability of its MegaHub Signal Transfer Point (STP) software.

DSC officials have acknowledged that faulty switch software on the company’s MegaHub STP led to the recent Signaling System 7 network failures of two local telephone companies.

The plaintiff claims to represent a class of shareholders who bought DSC stock during the past five months. DSC officials said the plaintiff, who alleges DSC violations of the Securities Exchange Act of 1934, has no basis for his claims.

Lotus lures 3Com E-mail users. Lotus Development Corp. last week said it is extending two incentive programs allowing users of 3Com Corp.’s 3+Mail and 3+Open Mail to migrate to Lotus’ cc:Mail. The programs, which were scheduled to expire in June, will continue until year end.

Lotus will offer a three-for-one trade incentive to any company converting more than 500 3Com 3+Mail or 3+Open Mail users to cc:Mail. There is no limit on how many 3+Mail or 3+Open Mail mailboxes can be converted to cc:Mail mailboxes under the program. For customers with fewer than 500 3+Mail or 3+Open Mail mailboxes, Lotus will offer one free cc:Mail DOS Platform Pack and an Eight-User Pack for each server version of 3Com mail converted. Lotus is developing a gateway that links cc:Mail to 3Com’s mail products. The gateway is scheduled to ship in September. ◘

Vendors push X Window System as OSI standard

Group: ANSI X3H3.6

Mission: To establish an OSI standard for adopting the X Window System.

Supporters:

- Amoco Production Co.
- Apple Computer, Inc.
- Data General Corp.
- Digital Equipment Corp.
- Electronic Data Systems Corp.
- IBM
- Massachusetts Institute of Technology, Laboratory for Computer Science
- Science and Engineering Research Council, Rutherford Appleton Laboratories
- Siemens Nixdorf Informationssysteme AG
- University of Lowell, Graphics Research Laboratory
- Xerox Corp.

GRAPHIC BY SUSAN J. CHAMPENEY

SOURCE: X3H3.6 TASK GROUP, WASHINGTON, D.C.

Group pitches OSI plan for X Window

Proponents say scheme would provide a common GUI, ease applications migration to OSI networks.

By Ellen Messmer
Washington Correspondent

WASHINGTON, D.C. — A group of users and vendors is planning to submit a proposal to the International Standards Organization (ISO) that calls for adoption of the X Window System to define graphical user interface standards for Open Systems Interconnection networks.

Adoption of the X Window System would enable software houses and users to develop applications with a common user interface. Such a move would also preserve the applications training users have in X Window applications for Transmission Control Protocol/Internet Protocol networks, which must be migrated to run on OSI networks.

X Window System is a software system developed by the Massachusetts Institute of Technology for creating graphical user interfaces.

Members of Task Group X3H3.6, a spin-off from an ANSI computer graphics task force, said that before they can offer the X Window proposal to ISO, the plan must first be approved by ANSI, which is expected to sanction the proposal by year-end 1992.

Henry Lowe, standards coordinator at Digital Equipment Corp., which is one of about a dozen companies backing the plan (see graphic, this page), said X Window System is already being assured fast-track consideration by ISO as a world standard.

“We’ve talked to the ISO graphics committee, SC24,” Lowe said. “They seem to think it’s a good idea. They’ve asked ANSI to submit it when they’re done.”

Lowe noted that users are demanding more applications for OSI networks, and a natural extension would be to migrate applications developed for TCP/IP and DECnet networks to OSI environments. Users also have expressed the need for an X Window-type environment in OSI nets.

“Customers say, ‘OSI is fine, but what can we do with it?’ ” he said. “We want the X Windows standard to work with OSI.”

> X Window System is being assured fast-track consideration by ISO as a world standard.

▲▲▲

Janet Leising, manager of X software development at Data General Corp., said the X3H3.6 group has completed the X Window Data Stream Definition, which differs slightly from the MIT X Window System. The software is used to write applications that interface with the X Window-based graphical user interface.

She said the group will now address how the X3H3.6 version of X Window System will be integrated with OSI products.

Leising also mentioned that the X Window System effort has

(continued on page 10)

Group pitches X Window plan

continued from page 9

been subject to deliberate delay tactics by some vendors opposed to seeing X Window used in OSI nets.

One consultant submitted nearly 800 comments against the proposed standard. Under Accredited Standards Committee procedures, the task group had to formally address each concern.

Once the proposal reaches ANSI, it will be considered under ISO's fast-track process, which allows a standard to be judged by ISO members in a ballot during the last stage of the standards development process, cutting the usual four-year review period down to a few months.

Lowe said the X3H3.6 group's work mirrors similar efforts on X Window System by the European Workshop on Open Systems.

He said the technical staff for the Joint Academic Network, an OSI net run by several universities, have developed an OSI-based X Window System.

Lowe and Leising declined to project when the two companies would offer X Window products for OSI networks.

However, Peter Bono, chairman of the X3H3 Technical Committee on Computer Graphics, predicted that vendors will begin releasing products once the proposed X Window System is approved as an ANSI standard in late 1992. ◼

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GDC exec maps out plan

continued from page 9

Although other struggling data communications suppliers have attempted to change their fortune by becoming involved in mergers or acquisitions, GDC is not looking to be acquired or buy any companies in the near term, according to Belson. However, GDC is seeking partnerships to bolster its product line.

"We are aggressively looking for strategic partners" to gain technology to boost the company's presence in the LAN interconnect market, Belson said. "For example, we have a complete international distribution structure. [Many LAN companies are small and] don't have access to that marketplace but would probably like to."

Industry observers said GDC has its work cut out for it as the T-1 multiplexer market continues to mature.

Jim Harrison, program director at the META Group, a Westport, Conn., market research firm, said GDC would be wise to focus on international sales since the T-1 multiplexer market is still growing in the global arena.

Ross Belson

Harrison added that GDC has a strength in Integrated Services Digital Network products that should help the firm market its wares overseas but may not fuel sales in the U.S. unless demand for ISDN services picks up here.

Todd Dagres, director of data communications research at The Yankee Group, a market research firm in Boston, said GDC needs to make a commitment to some of the hotter network technologies.

"The problem with General DataComm is just that, as its name indicates, they are in the general market for products such as modems and muxes," he said.

"The companies that are going to be successful are the ones that would be called Focused DataComm, not General DataComm," he added. "GDC needs to embrace high-speed connectivity of LANs and take advantage of the economies offered by new switched services from the carriers." ◼

TELECOMMUNICATIONS

CARRIER SERVICES, CENTREX, CPE, WIRING SYSTEMS AND BYPASS

Worth Noting

Small businesses are willing to pay $25 a month for caller identification service with caller name display, according to a recent survey of 200 users by O'Brien Associates, a Villanova, Pa., consultancy. With name display, the caller's name is displayed on the phone's LCD or on an adjunct display device.

Carrier Watch

The Hertz Corp. last week established Hertz Technologies, Inc., a wholly owned subsidiary that will resell custom network packages consisting of voice and data net services from its Tariff 12 arrangement with AT&T.

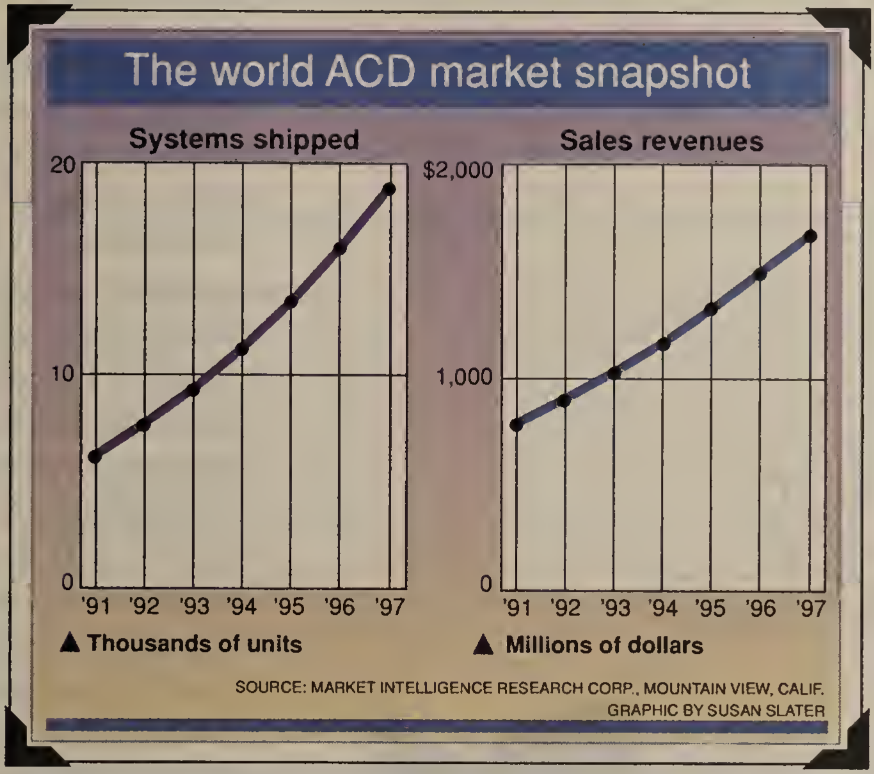
The company holds Virtual Telecommunications Network Service Option 25, a five-year Tariff 12 deal that has a $9.1 million minimum annual charge.

Hertz Technologies places orders with AT&T, monitors ongoing usage of its Tariff 12 net and handles billing. The company will also offer systems integration, programming, consulting and facilities management services.

"We can provide the technical support and service necessary to make this offering a successful venture for customers of the services and Hertz," said Gary Orrell, Hertz Technologies' president and chief operating officer.

Hertz is reselling the services for profit, not to meet minimum annual charge requirements of the Tariff 12 contract, a company spokesman said.

Hertz Technologies is based in Oklahoma City, where the company's data and reservation centers are located.



The world ACD market snapshot

SOURCE: MARKET INTELLIGENCE RESEARCH CORP., MOUNTAIN VIEW, CALIF.
GRAPHIC BY SUSAN SLATER

MCI telephone bills played central role in murder case

Prosecution, defense produce different versions.

By Daniel Briere
Contributing Editor

It seemed like the perfect alibi: telephone company records that show the defendant could not have called her mother from her home phone and made it to the murder scene in time to commit the crime.

Long-distance billing took center stage in the trial of Carolyn Warmus, a former elementary school teacher accused of murdering her lover's wife, Betty Jeanne Solomon, in New York on Jan. 15, 1989.

At issue was MCI Communications Corp.'s billing accuracy. The prosecution brought several MCI witnesses to the stand in an effort to explain why there were different versions of one of Warmus' monthly MCI bills — one listing a crucial 6:44 p.m. call to the defendant's mother and the other without it.

The prosecution entered into evidence telephone records that showed calls were placed from Warmus' home to a New Jersey gun shop. To counter, Warmus' lawyer presented her January 1989 MCI billthat showed the gun shop call and a 6:44 p.m. call to her mother.

According to MCI testimony, that bill may have been faked. Up until February 1989, MCI bills contained the slogan "Communications for the next 100 years." The defense's version did not have that slogan.

The prosecution's version was taken directly from MCI computers. But later testimony from another MCI employee showed that the carrier's own computer records did not ring true.

Evidence submitted from a master MCI computer tape should have matched the microfiche version of the bill MCI claims it sent to Warmus. But the microfiche copy only showed a 10:32 a.m. call to Warmus' mother on the day of the murder.

Among the reasons suggested for the discrepancy: computer error and tampering.

The trial ended in a hung jury, and the case will be retried this October.

Briere is president of TeleChoice, Inc., a Montclair, N.J. consultancy.

Users petition FCC to rethink fraud ruling

Users say implications of toll fraud decision are too critical to let Common Carrier Bureau ruling stand.

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — Several users are urging the FCC to reconsider a recent ruling on toll fraud because they fear the decision could derail efforts to set national guidelines for assessing liability in telephone fraud.

At issue is a May decision in which the Federal Communications Commission's Common Carrier Bureau ruled against Chartways Technologies, Inc., a computer software services company based in Rockville, Md. The FCC sided with AT&T by saying the user was liable for the full amount of fraudulent calls made on its network.

The firm, which lost more than $500,000, challenged AT&T's assertion that tariff language clearly holds customers responsible for paying all fraudulent charges placed over their networks. The firm also said AT&T did not properly warn it of the risks of toll fraud associated with private branch exchanges.

Chartways said the implications of the case are too important to let the FCC's first and only ruling on toll fraud rest with staff members of the Common Carrier Bureau and asked the agency to reopen the case.

Two other customers, Mitsubishi International Corp. and Pacific Mutual Life Insurance Co., filed documents supporting the request to reopen the case.

After reviewing the FCC's decision on Chartways' case, Mitsubishi and Pacific Mutual said they fear the FCC ruling will be interpreted too broadly. Both companies are currently lobbying the FCC to lay out rules on how toll fraud liability should be spread among users, equipment manufacturers and carriers.

In addition to the rule-making proceeding, Mitsubishi said there may be hundreds of other complaints or lawsuits at the FCC, state regulatory agencies or courts that could be prejudiced by the FCC ruling.

Pacific Mutual is concerned that the FCC's Chartway decision may be misused by long-distance carriers.

Both Mitsubishi and Pacific Mutual are concerned AT&T will begin aggressive legal actions against customers since the FCC ruled against Chartways. They both included letters from AT&T to customers touting the Chartways decision and demanding payment for toll fraud.

Although the FCC ruled that AT&T's tariff language protects it from absorbing losses in cases of toll fraud, the agency indicated the Chartways ruling would not affect the separate rule-making effort to have tariff language changed to spread the liability.

But despite the FCC's assurances, users said they think the agency failed to realize the extent to which the ruling might spill over to other cases. "The decision is the first commission interpretation of that portion of AT&T's tariffs that is the seminal point for determining whether PBX users who have been victimized by fraud are, nonetheless, to be held totally responsible for the losses," Mitsubishi said in a filing at the FCC.

Mitsubishi has filed a complaint challenging AT&T's assertion that tariff language clearly holds users responsible for fraudulent charges. Mitsubishi reasons that since hackers call into the PBX on a local or 800 line and then trick the PBX into switching them out over the long-distance network, the fraudulent calls originate at a pay phone and not at the user site. Under this interpretation, users would not be responsible for the charges.

WASHINGTON UPDATE

BY ELLEN MESSMER

AT&T challenges proposed billing change. AT&T last week strongly criticized an effort in Congress that would require long-distance carriers to structure billing methods for residential customers in the same way that they do for businesses. Currently, business users are typically billed for the first 30 seconds of a voice call and then each additional six- or one-second increments thereafter. But almost all residential calls are charged in one-minute increments, with any time under one minute being rounded up to the next minute.

Sen. Howard Metzenbaum (D-Ohio) declared this practice unfair, and in April, he introduced a bill that would require the long-distance carriers to do subminute billing for residential customers. He estimates that the carriers make about $1.6 billion each year by rounding calls up to the nearest minute.

At a hearing last week, several consumer groups said they strongly support the measure but an official from AT&T protested the move. Merrill Tutton, vice-president of consumer services at AT&T claimed that long-distance carriers would likely respond to the legislation by raising prices to compensate for the lost revenue.

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The modem is fully compatible with CCITT V.32 for 9600 bps communication. MNP® level 5 data compression increases throughput to 19.2 kbps; V.42 *bis* compression pushes it all the way to 38.4 kbps. For error control, users may select MNP levels 2–4 or V.42 LAP-M.

The V.3242i automatically senses the speed of the remote modem it's connected to and adjusts to that speed. It has auto-dial and auto-answer capability for synchronous communication. When installed on private networks, it provides automatic dial back-up in the event of leased-line failure. It is available as a standalone unit or as a plug-in card.

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DATA COMMUNICATIONS

PRODUCTS, SERVICES, ARCHITECTURES, STANDARDS AND NETWORK MANAGEMENT

Worth Noting

"Nobody's putting in new X.25 services. [Users are] really focused on evolving their X.25 services toward a frame relay solution."

Daniel Warmenhoven
Chairman and chief
executive officer
Network Equipment
Technologies, Inc.
Redwood City, Calif.

Data Packets

Network Software Associates, Inc. (NSA) recently introduced a new driver that enables the OS/2 version of its AdaptSNA RJE personal computer-to-host communications software to support the IEEE 802.2 Logical Link Control (LLC) protocol.

AdaptSNA RJE lets a personal computer running OS/2 emulate an IBM 3770 Remote Job Entry terminal, which is used for high-speed file transfer and print applications.

Support for 802.2 will enable the product to transfer data to a host via devices attached to local-area networks, such as token ring-attached front-end processors. IBM's Personal Communications/3270 · terminal-emulation package is also supported. Available now, AdaptSNA with the 802.2 driver is priced at $785.

Infonet Services Corp. of El Segundo, Calif., recently announced it now offers **SoftSwitch, Inc.'s** SoftSwitch Central as a service over the Infonet public network. SoftSwitch Central lets users integrate multiple electronic mail systems into a single logical system and provides document translation, routing, logging, accounting and directory services.

Infonet also announced it has licensed SoftSwitch MAILbridge Server products that supply gateways between various proprietary E-mail systems through SoftSwitch Central. ◻

GEIS licenses RSA wares to support digital signatures

Firm would support feature on EDI, E-mail services.

By Ellen Messmer
Washington Correspondent

ROCKVILLE, Md. — GE Information Services (GEIS) recently licensed RSA Data Security, Inc. encryption products that may eventually enable it to offer digital signature encryption services on its value-added network, *Network World* has learned.

GEIS would like to use RSA's digital signature capability with its electronic data interchange and electronic mail services, as well as customized network applications, according to Gary MacPhee, GEIS' manager of processing capabilities marketing.

But he acknowledged that the company must persuade the U.S. government to lift its export ban on digital signatures before the service can become widely available.

Digital vs. public key

Public-key digital signature methods allow users to add their own encrypted seal to either an encrypted or clear-text message, thus providing a source of authentication for transmitted messages.

Digital signatures distill the uniqueness of a file into a compact digital representation that the user encrypts with a private encryption key. The digital signature is decrypted on the receiving end using the signer's public key.

The RSA system provides both digital signatures and message encryption, but according to MacPhee, GEIS has received strong customer demand primarily for the digital signature capability.

A large international GEIS customer, whose name MacPhee declined to disclose, has received special permission from the U.S. Department of Commerce to use digital signatures for international messaging activities.

GEIS entered into the licensing arrangement with RSA primarily to serve the client, but MacPhee said GEIS is optimistic that other customers will be able to obtain special permission from the government as well.

However, GEIS would prefer to be able to offer the digital signature service to all of its customers. Toward that end, it plans to approach the Commerce Department to lobby for lifting the digi-

(continued on page 14)

Digital Access to serve up enhancements to Fracdial

By Paul Desmond
Senior Editor

RESTON, Va. — Digital Access Corp. last week provided a glimpse into the future of its Fracdial bandwidth-on-demand device, saying that by early next year, the offering will support bridged videoconferences and links to Unix workstations.

Fracdial lets a user make multiple switched 56K or 64K bit/sec calls and pool the resulting bandwidth, enabling it to be dedicated to a single application. Two models are available. The Fracdial 14x1 supports as many as 14 switched calls and a total bandwidth of 768K bit/sec, while the Fracdial 24x1 supports as many as 24 calls and 1.344M bit/sec.

Peter Beck, chairman and chief executive officer of Digital Access, based here, said the company plans to add a multiparty videoconferencing capability to existing Fracdial products in the first quarter of 1992. He said the firmware upgrade would be an alternative to more expensive multichannel control units (MCU) that cost between $10,000 and $25,000 per port.

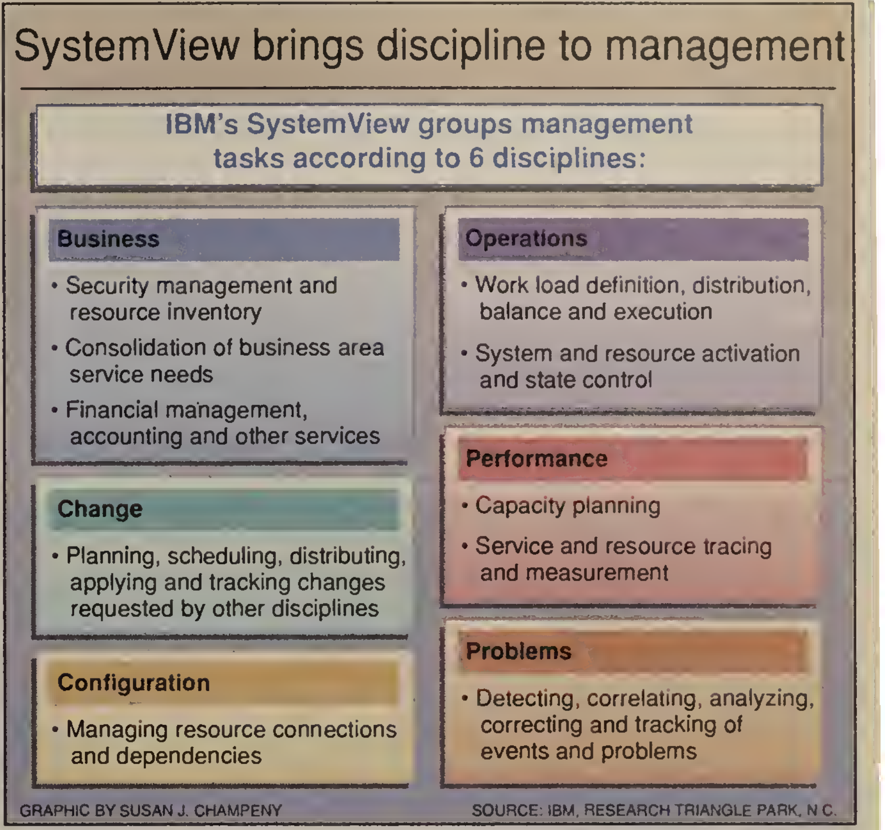
Some of those MCUs support a capability that lets every site participating in a videoconference view every other site. Digital Access' product will be targeted at lower end applications in which the site controlling the videoconference can see all participants but the remote sites see only the participants at the controlling site.

Digital Access will offer the feature at a price of between $2,000 and $4,000 per port, in addition to the cost of the Fracdial itself, Beck said. The Fracdial 14x1 costs $6,995, while the 24x1 costs $11,500.

Also early next year, Digital Access expects to offer direct connections from Fracdial to Unix-based workstations. A new interface board and software will make Fracdial compatible with Unix communications packages such as those that support the Se-

(continued on page 14)

SystemView brings discipline to management



IBM's SystemView groups management tasks according to 6 disciplines:

Business
- Security management and resource inventory
- Consolidation of business area service needs
- Financial management, accounting and other services

Change
- Planning, scheduling, distributing, applying and tracking changes requested by other disciplines

Configuration
- Managing resource connections and dependencies

Operations
- Work load definition, distribution, balance and execution
- System and resource activation and state control

Performance
- Capacity planning
- Service and resource tracing and measurement

Problems
- Detecting, correlating, analyzing, correcting and tracking of events and problems

GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: IBM, RESEARCH TRIANGLE PARK, N.C.

IBM describes grand SystemView vision

Strategy lets mgmt. applications communicate, enhances automation, pumps up productivity.

By Paul Desmond
Senior Editor

RESEARCH TRIANGLE PARK, N.C. — In recent interviews here, IBM detailed its vision of how its SystemView strategy will allow users to integrate network and systems management functions, improve productivity and automate a variety of tasks.

SystemView, announced last September, consists of a series of open interfaces that make it easier for network and systems management applications to communicate with one another. It promises to provide vendors with a blueprint for building management applications that have many features in common, including a user interface, data base and device descriptions.

SystemView is a long-term strategy that IBM expects other vendors' products to comply with over time. The company is just beginning to release documents that explain how to build SystemView-compliant products.

Marie Early, program manager in IBM's Enterprise Systems group, said SystemView defines three areas of integration in terms of systems and network management: the end-use dimension, or user interface; the data dimension, which includes a common data storage facility; and the application dimension, which defines a series of program-to-program interfaces used to ship data between applications.

The front-end user console for management applications is defined as a Personal System/2 running OS/2 Extended Edition and a graphical interface package that complies with the IBM Systems Application Architecture Common User Access specification. The idea is to improve on the current method where the language and layout of user interface screens vary by product, meaning users have to be intimately familiar with any management tool they use.

"That gives every opportunity for the end user to make a mistake," Early said.

Another aspect of the end-use dimension is common input to network and systems facilities, such as IBM's NetView, the Network Control Program (NCP) and VTAM. For example, a terminal may be described in one program as "term" and in another as "terminal." Under SystemView, each network and systems resource would have a single name that would be used in any compliant product.

IBM earlier this year started shipping its SystemView End-Use Dimension Consistency Guide, which details how to build products that comply with the SystemView interface specification.

Pooling management data

Many management applications today use their own data bases, which means management data is replicated many times. SystemView's data dimension defines a single data base of man-

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IBM details grand SystemView vision

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agement information, dubbed the Enterprise Information Base (EIB).

The EIB would reduce the duplication of effort required in today's data centers. For example, facilities such as NCP and VTAM have their own configuration data bases; therefore, different users have to enter essentially the same data to each. The EIB will provide a common configuration data base that can by used by any compliant application, Early said.

Although considered a single logical data base, the EIB will be a distributed data base built around the SQL standard.

The data dimension also specifies that vendors describe network and systems management resources according to a common, object-oriented data model based on the Open Systems Interconnection 10165-4 data format specification. That compliance will make it easier for different applications to work together because they will have a common way to describe the resources being managed.

Late this quarter, IBM will publish its SystemView Data Model Reference manual, which defines how to build products that comply with the data model, Early said.

In between the end-use and data dimensions is the application dimension, which consists of management applications and defines the program-to-program interfaces between them. The interfaces, for example, will let one application invoke another if a predefined threshold is exceeded. They also support the exchange of configuration data among applications.

"Today, there are few program-to-program interfaces [between management applications]," she said. "There is little logic flow from Program A to Program B, even though it makes sense in many cases."

The logic flow among applications would be based on six disciplines that make up another piece of the SystemView puzzle (see graphic, page 13). The disciplines are designed to promote end-to-end systems and network management according to general types of functions, such as performance, change and configuration management.

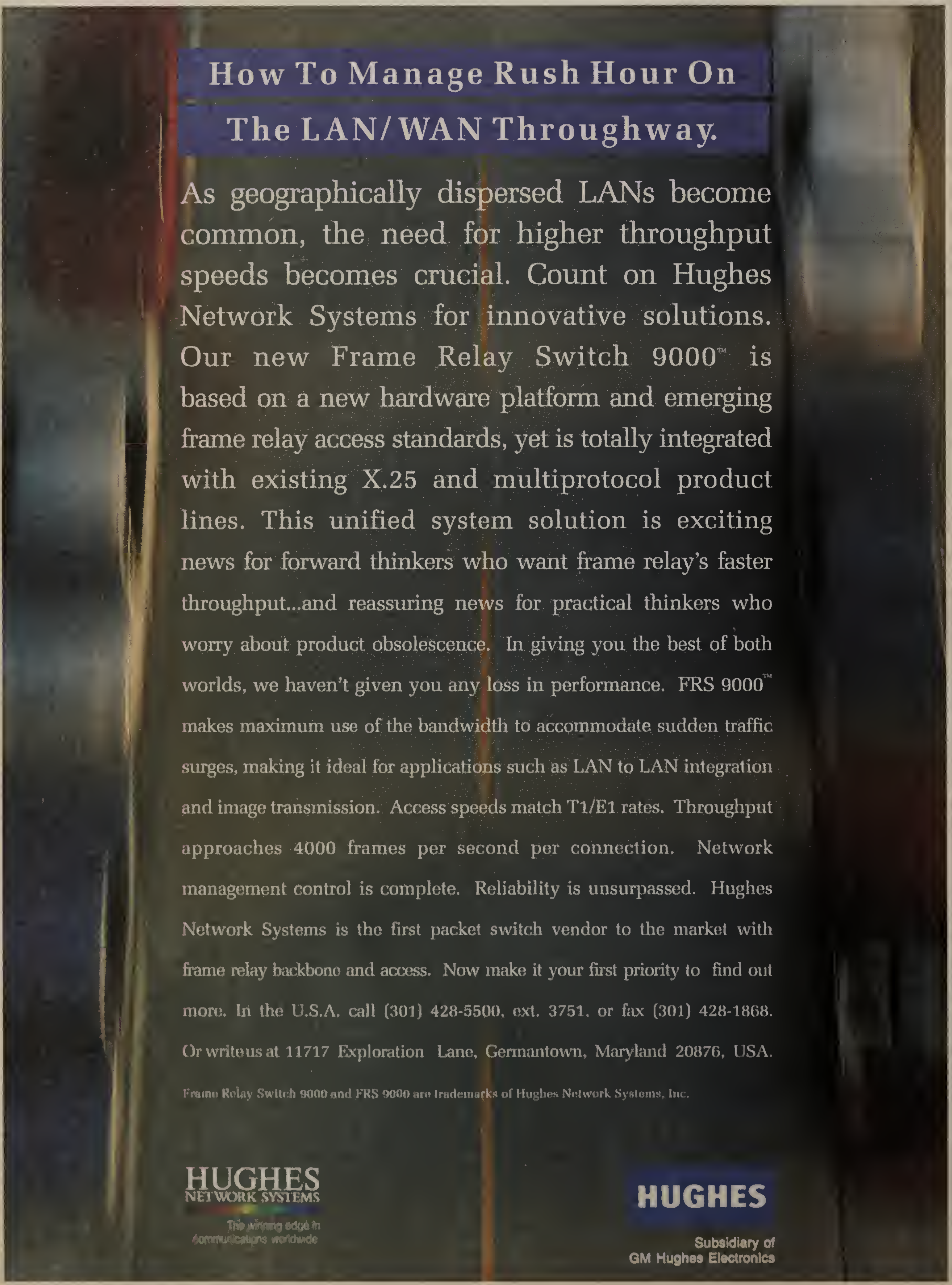
For example, after a problem occurs, some change is typically required, which results in a configuration update. The application program interfaces defined by SystemView provide the hooks between applications that would make it possible to trigger an automatic configuration update after a change occurs.

Prototypes of expert systems

Such automation is another theme behind SystemView, Early said. It means, for example, that problem determination applications must be able to feed into some kind of rules-based expert system that responds to the problem according to predefined policies. Such expert systems are still under development, but two IBM prototypes exist. One is for hosts and the other for networks, but both address management and outage avoidance.

With regard to expert systems, Early said IBM is still grappling over whether it's better to offer expert systems with a small number of generic rules to let users and other vendors build upon or to offer an expansive rules set that would have to be tailored to each specific environment.

In the next SystemView announcement, Early said to look for IBM to unveil more new or enhanced products that conform to SystemView and to announce extensions to its vendor partner program.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GEIS licenses wares to support signatures

continued from page 13

tal signature ban.

The recent decision by the National Institute of Standards and Technology (NIST) to back the National Security Agency's version of ElGamal as a proposed U.S. government encryption standard is forcing companies providing encryption products to consider the impact that could have on their business.

MacPhee acknowledged that if the NIST proposal does become a government standard, GEIS might be forced to provide it in the future. But GEIS selected RSA's encryption systems to satisfy the immediate demand for digital signatures, particularly in the banking industry.

Next month, GEIS plans to reveal its long-term plans for integrating public-key encryption into its network services.

Digital Access to enhance Fracdial

continued from page 13

rial Line Interface Protocol.

The upgrade is targeted at users that require high-speed file transfer capabilities, for applications such as image or computer-aided design and manufacturing.

For these offerings, Fracdial sits on the user's desk and "functions as a humongous dial-up modem," Beck said.

Fracdial requires a T-1 access line to a local exchange carrier, over which the unit transmits call setup data to a long-distance carrier. The data is used to establish multiple switched calls, and Fracdial synchronizes the calls on each end to provide a single high-speed channel.

Beck said the company will also provide an E-1 version early next year.

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LOCAL NETWORKING

PC AND TERMINAL-TO-HOST LANS, GATEWAYS AND MICRO COMMUNICATIONS PRODUCTS

Worth Noting

Texas Instruments, Inc. earlier this month shipped its one millionth token-ring chipset. Research firm Dataquest, Inc. estimates token-ring consumption in the U.S. will grow at a 22% compound annual growth rate through 1995. This will result in a nearly $1 billion retail market.

Netnotes

Tricord Systems, Inc. last week brought out a low-cost addition to its PowerFrame family of superservers designed to serve as an entry-level system for customers that want to upgrade from a personal computer server to a superserver but do not need a full-blown high-end system.

The new server, called the PowerFrame 30I/25, costs just under $20,000 and includes Tricord's Intelligent Input/Output Processor, which can support as many as seven Small Computer System Interface disk drives.

The PowerFrame 30I/25 is available now.

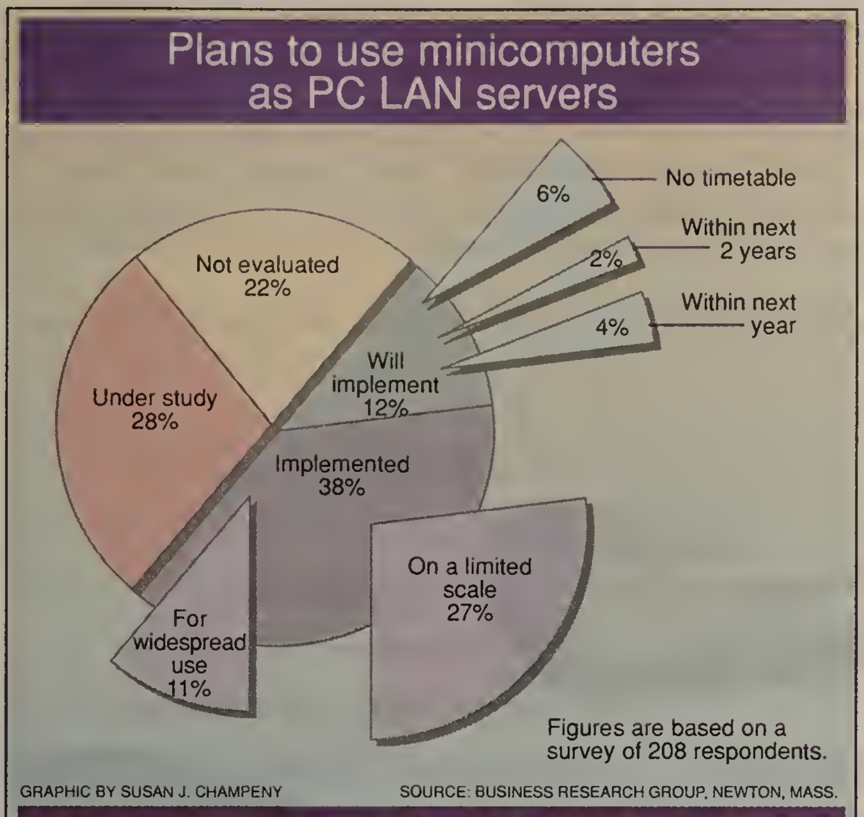
SunSoft, a subsidiary of Sun Microsystems, Inc., last week released two additions to its existing SunShield line of network security products.

The first, Account Resource Management (ARM), is a set of administrative tools to help control access to user accounts on a Unix network. ARM contains such features as password aging, which invalidates passwords after a specified period of time.

The second product, the Automated Security Enhancement Tool (ASET), automatically upgrades or downgrades access rights for a user account.

An ARM/ASET package, expected to be available in the third quarter, will cost $295 for a single-user license and $4,500 for a site license.

Plans to use minicomputers as PC LAN servers



Figures are based on a survey of 208 respondents.

GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: BUSINESS RESEARCH GROUP, NEWTON, MASS.

Microsoft broadens SQL Server support for nets

New version runs on Banyan VINES for first time.

By Timothy O'Brien
West Coast Bureau Chief

REDMOND, Wash. — Microsoft Corp. last week announced an enhanced version of its SQL Server data base product that offers expanded capabilities when used in Novell, Inc. networks, first-time compatibility with Banyan Systems, Inc. nets and client-level compatibility with Sybase, Inc.'s Unix and VAX SQL products.

Although SQL Server Version 1.11 does not add any new features at the server level, it is significant because it broadens network support by adding Banyan support and enables the client component of the software to access Sybase SQL Servers on Unix and VAX hardware platforms.

"We are working with our development partner, Sybase, to evolve SQL Server and enhance connectivity to other platforms," said Gary Voth, product manager for SQL Server at Microsoft.

Microsoft's SQL Server, codeveloped with Sybase, is a relational data base management system designed for personal computer local-area networks. The product's client/server architecture divides processing tasks between the client and server workstations on the network.

Although Microsoft had already recognized the fact that the product had to be compatible with Novell nets as well as its own LAN Manager if it was going to be successful, Microsoft is branching out further by adding SQL Server support for Banyan nets.

Since Banyan has just begun supporting OS/2 with Version VINES 4.10, it had not been possible to run the OS/2-based SQL Server in that environment. Microsoft and Banyan have now certified SQL Server Version 1.11 for use in VINES 4.10 nets.

Voth insisted, however, that Microsoft would continue to add SQL Server features that exploit LAN Manager's architecture.

In terms of Novell support, the new version of SQL Server pulls together software patches that correct problems in SQL Server administration tools and utilities.

In addition, Microsoft has completed certification of SQL Server using Novell's latest OS/2 Requester Version 1.3.

With this upgrade, SQL Server licensees will receive from Microsoft a complimentary single-user copy of Datura Corp.'s SQL Commander when they return their server registration card. SQL Commander is a Microsoft Windows-based data base administration tool that allows network administrators to manage index tables and perform complex queries.

The SQL Server pricing and packaging has also been changed with this version. The existing five-user version, available for a promotional price of $995, has been replaced by a 10-user version, which will cost $2,995. Customers of the five-user version will be able to upgrade to a 10-user version for $495.

The unlimited version costs $7,995 and the Unlimited User Upgrade Pack is priced at $5,495.

Examining wireless LAN technologies

Vendors look to everything from infrared light to narrowband radio signals to do away with wires.

By Caryn Gillooly
Senior Editor

As wireless local-area networks become a more feasible, cost-effective option for a growing number of users, it is important to take a look at the basic technological differences and the various benefits and drawbacks of the products.

Three of the leading wireless vendors, for example, use different transmission technologies. BICC Communications uses infrared light in its InfraLAN product, while Motorola, Inc. uses narrowband radio transmissions with its Altair product, and NCR Corp. uses spread-spectrum radio transmissions in its WaveLAN product.

BICC's InfraLAN, announced in January and made available in April, is compliant with the IEEE 802.5 token-ring standard and uses LEDs to transmit data. That is the same type of undetectable light used in television remote controls.

The InfraLAN product includes base units and optical transceivers. The LAN devices are attached to the base units, which can support as many as six devices and are linked, in turn, to wall-mounted transceivers that convert electrical I/O to optical signals.

InfraLAN transceivers can be approximately 80 feet apart, and the system transmits data at 4M bit/sec.

The advantages infrared has over other technologies include immunity to radio frequency interference and the fact that the products using it do not have to be licensed by the Federal Communications Commission.

Because the infrared light does not travel through walls or obstructions, the ideal use for InfraLAN is in an open office environment with partitions, instead of in individual offices, factories or on retail floors.

Motorola's Altair, announced and made available in February, uses high-frequency radio waves

(continued on page 18)

SNMP manager eases use of private MIB extensions

By Timothy O'Brien
West Coast Bureau Chief

MOUNTAIN VIEW, Calif. — Hughes Network Systems, Inc. recently announced a new version of its Monet SNMP-based network manager that enables users to more easily accommodate vendor-specific extensions to standard Simple Network Management Protocol Management Information Bases (MIB).

Monet Version 4.0, which runs on a Sun Microsystems, Inc.'s SPARCstation, makes it possible to integrate private MIB extensions directly into an SQL relational data base and to manage the devices that use the extensions within an hour of loading the software. MIBs define objects that can be managed using the SNMP.

Monet can support any MIB that conforms to ASN.1. MIBs prepackaged with the product include the Internet Standard MIB II, MIBs for all Hughes products, as well as MIBs from Advanced Computer Communications, Cabletron Systems, Inc., Cisco Systems, Inc., David Systems, Inc., Proteon, Inc., Optical Data Systems, Inc., SynOptics Communications, Inc. and Wellfleet Communications, Inc.

The Unify, Inc. relational data base used in Monet will enable users to customize the way they use MIBs by arranging and grouping various MIB attributes in a manner that makes sense for their particular networks. The SQL data base will also let users log network faults and generate custom reports on device failure history and performance.

In addition, Version 4.0 of the product includes an upgraded configuration module that is capable of automatically learning the parameters of registered network devices and entering them into the data base.

Automating the configuration process saves users input time and increases configuration accuracy.

Monet is available now for $14,950, which includes two days of installation and training.

Wireless LAN technologies

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to transmit data at 15M bit/sec and is compatible with IEEE 802.3 Etherent LANs, according to the company, based in Arlington Heights, Ill.

Motorola has licensed frequencies in the 18-GHz range from the FCC for use with the product.

Altair consists of two devices — a control module and a user module. The user module, like the InfraLAN's base unit, can accommodate six network devices. Those devices are attached to the module using either standard Ethernet or coaxial cabling, but the offering does not support 10BaseT unshielded twisted pair.

The user modules convert the electrical signals to radio signals, which are picked up by a control module placed at the center of a work group. The control module acts as a router and, when attached to a wired network, acts as a bridge.

Both the user and control modules have lists of network addresses. The user module has the addresses of all devices physically attached to it, and the control module has a master list of all addresses on the wireless net.

When an end user at a personal computer sends a message, for example, the user module first determines if the recipient is locally attached. If the address is for a remote device, the module sends the message to the control module, which forwards it to the receiving node.

The control module, which must be located seven to 15 feet above ground, can receive and transmit radio-based information in a work group of as many as 32 devices in an area of about 5,000 square feet.

Mil Ovan, senior marketing manager for Motorola's Altair product operations, said one of the advantages of Altair is that there is no fear of interference because Motorola is the only company licensed to send information at these specific frequencies. He added that because radio transmission is not a line-of-sight technology, it can be used in workplaces with both open and closed offices.

On the downside, because data is sent at such a high frequency, it is denser than information sent at lower frequencies. Therefore, it cannot travel as easily through walls, and the signal cannot travel as far as information sent at lower frequencies.

Just as narrowband information is sent over a narrow, licensed frequency, spread-spectrum technology works by sending the same amount of information over a broad, unlicensed span of frequencies. NCR's WaveLAN, announced and shipped last fall, sends data using a spectrum of frequencies ranging from 902 to 928 MHz.

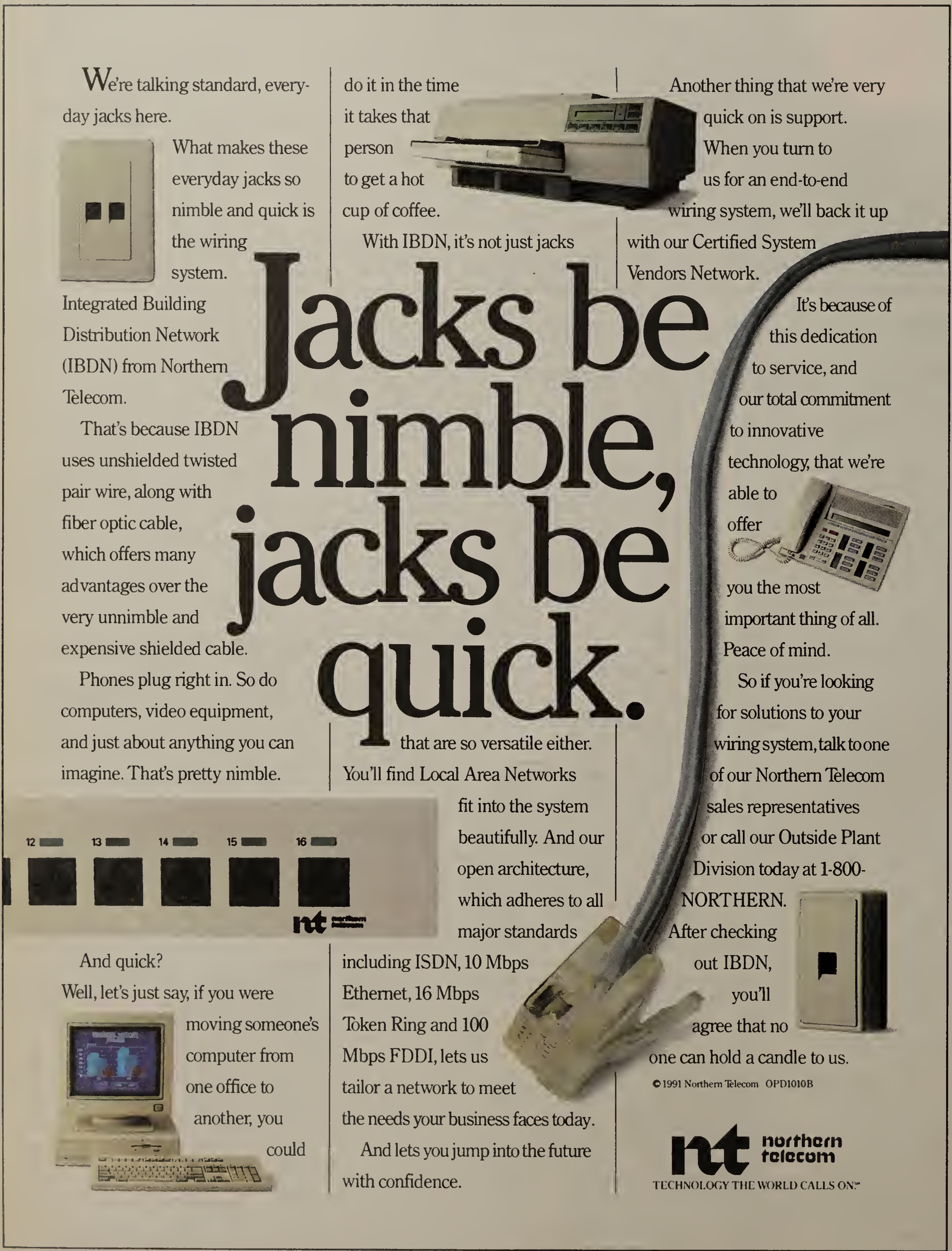
The product consists of a network interface card that fits into any expansion slot in an IBM Personal Computer AT or compatible with an Industry Standard Architecture (ISA) or Microchannel bus. It also includes an antenna housed in a 3-in. case. Each node has its own antenna.

The WaveLAN network interface card acts as both a transmitter and receiver, converting electrical signals to radio waves. WaveLAN, which can transmit information at 2M bit/sec over a 50,000-sq-ft area, can be connected to both Ethernet and token-ring nets.

According to Daryl Maddox, senior product manager at NCR, based in Dayton, Ohio, one of the primary advantages of WaveLAN is that it does not have to be licensed by the FCC. Another is that because transmissions are at a lower frequency, signals can travel farther — covering an area up to 50,000 square feet — and can more easily penetrate walls and other objects.

On the downside, because WaveLAN operates in the same radio spectrum as other devices, interference is always a possibility. It is also slower than the other technologies.

NCR's WaveLAN costs $1,390 for the network interface card and antenna. Motorola's Altair costs $3,995 for the control module and $995 for each user module, while BICC's InfraLAN costs $2,995 for each base unit. ◘



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MANAGEMENT STRATEGIES

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Dialogue

Do you think there will be widespread demand for wireless communications in the future?

"There will be a large demand, but it won't occur for another four or five years.

"It'll be a niche technology for a while, but once the major issues are resolved, it'll be a major technology in the future. In today's corporate environment, the mobility to be gained from wireless systems is an absolute plus."

Woody Randall
Vice-president of communications
Citizens & Southern Sovereign Bank of South Carolina
Columbia, S.C.

"I don't think it will ever be a replacement for the traditional office-cabled LAN because of bandwidth, interference and security issues. But I do see it as a viable niche technology because there are numerous applications that lend themselves well to wireless systems."

Gregory Scott
College of Business
Computing services manager
Oregon State University
Corvallis, Ore.

"It'll be a niche technology in the short term, such as using it in building environments that are difficult to wire. It has a chance in the late 1990s of being a dominant networking method, but that depends on technological advancements in cell development and regulatory changes."

Charles Snell
Director of computing and communications
Harris Corp.
Melbourne, Fla.

"There'll be a lot of interest in wireless communications, especially where there's the high cost and hassle of wiring a large telephone network. Wireless is just a niche technology, but it will have widespread appeal once there are more frequencies available and, more importantly, standards are put in place.

"But that won't occur before 1993. Until then, manufacturers will be reluctant to commit themselves to massive production of wireless systems."

Robert Bursick
Director of telecommunications
Wayne State University
Detroit

User feedback essential in retaining customer loyalty

Net managers survey users to gauge contentment.

By Maureen Molloy
Staff Writer

The growing threat of outsourcing and the increasing willingness of end users to fend for themselves is forcing network managers to solicit more feedback from in-house customers on the quality of network services.

Mary Johnston-Turner, a principal at Northeast Consulting Resources, Inc. in Boston, said many network departments are resorting to formal surveys to better gauge user satisfaction.

"Using internal benchmarks to determine if the network is meeting your service goals is an important first step," Johnston-Turner said. "But managers are finding they must go beyond that and ask the end user directly if they're really doing as well as they think they are."

Rating services

Rockwell International Corp. did just that two years ago when it sent a questionnaire to more than 1,000 customers — from top-level executives to support staff — asking them to rate the quality of things from standard telephone service and repair response time to individual network applications. And the results proved invaluable, according to Robert Bystedt, Rockwell's director of telecommunications services.

Although his department generally received favorable ratings, users pointed out shortcomings in several areas.

"We were told our services cost too much and that we take too long to implement new applications," Bystedt said. "What's important is that we had no idea users thought this way."

Meeting customer expectations is key, he added, particularly in organizations that charge back for their services.

"The MIS department is no longer the only game in town," Bystedt said. "Users now have the option of going out and implementing their own systems if they're not satisfied with the central computing organization. End users are more sophisticated today and, thus, more apt to choose that option."

According to Charles Murray, telecommunications director at The Travelers Corp., a Hartford, Conn., insurance company, many network managers have traditionally measured service quality and reliability solely by their department's ability to resolve specific customer complaints. It wasn't until recently that managers began to aggressively solicit user response.

"You can't wait until someone calls with a complaint because many users won't complain," he said. "The end user is much more

(continued on page 27)

GUIDELINES

BY ERIC SCHMALL

Network managers must keep trials in perspective

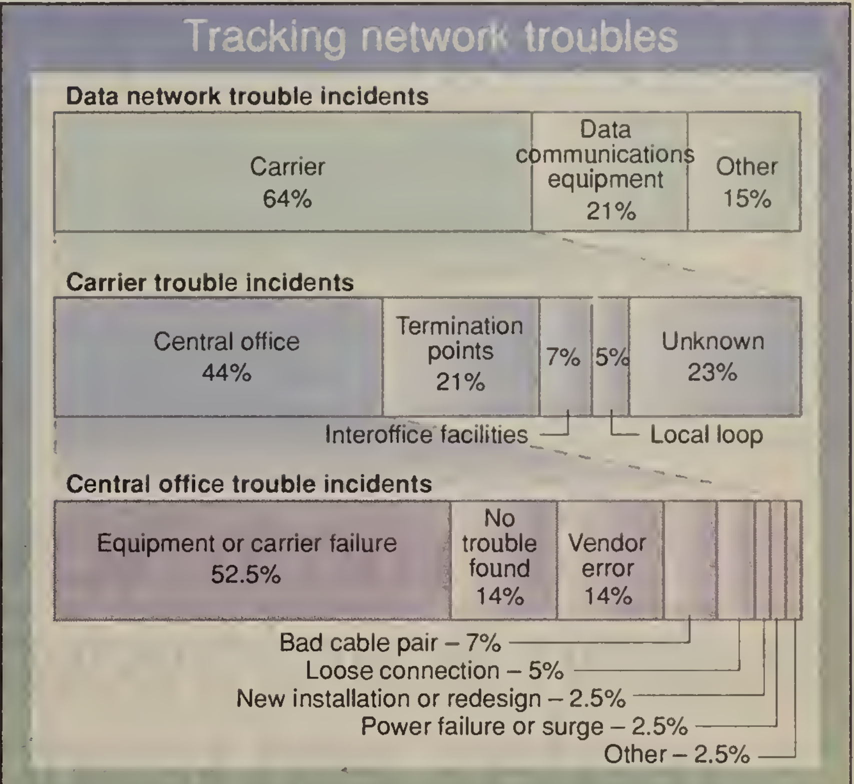
Whenever network managers test a new product or service, they would do well to heed the advice in a Kenny Rogers song about card playing: "You gotta know when to hold 'em/Know when to fold 'em."

Network managers can become so enthralled by the promise of new equipment or services to reduce costs or enhance net performance that they lose all objectivity. In their quest to score a big run for the company and gain personal recognition from top management, net managers may discount negative test results and proceed headlong into a disaster of their own making.

For instance, a network manager may learn that he or she can reduce annual private-line expenses by hundreds of thousands of dollars by contracting services from a different carrier. After talking with the carrier, the net manager sells the idea to senior management and gains the approval of users to

(continued on page 27)

Schmall is a network systems manager for an insurance holding company.



Information was taken from an actual weekly report generated by the network department at FPL. The figures are for the first 6 months of 1991.

GRAPHIC BY SUSAN J. CHAMPENEY SOURCE: FLORIDA POWER & LIGHT CO., MIAMI

FPL's quality control plan betters service

Florida power company uses weekly reports to stay on top of network and vendor performance.

By Wayne Eckerson
Senior Editor

MIAMI — Florida Power & Light Co. (FPL) has made a science out of tracking network performance, as well as keeping tabs on network vendors and the quality of service they provide.

Each week, the utility company, based here, generates about 100 pages of charts, tables and graphs that provide its network managers with a detailed analysis of carrier performance and a complete breakdown of problems occurring in the firm's voice and data networks (see graphics, this page and page 20).

That information has enabled FPL to identify and eliminate the source of many problems that previously would have gone undetected. It has also helped the company establish closer working relationships with its suppliers.

"We're trying to develop positive, constructive relationships with vendors," said Everett Stonebraker, supervisor of telecommunications at FPL. "We examine the root causes of [all network] problems and then try to get vendors to change their internal processes so the same problems don't happen again."

By working more closely with carriers and net equipment vendors, FPL has reduced downtime on its IBM Systems Network Architecture net twentyfold and improved the average service restoration time from about four hours in 1987 to the current 24 minutes, said Jim Hicks, supervisor of telecommunications operations for the power company.

On the voice side, FPL has reduced downtime of telephone sets from 21.3 hours per week to 89 minutes per week since 1987, Stonebraker said.

These gains are good news for FPL, which has made improving the quality of supplier service and products a top priority. In 1989, FPL became the first U.S. firm to receive the prestigious Deming Award for its success in applying total quality management principles. The award is given annually by the Japanese Union of Scientists and Engineers.

The linchpin of FPL's supplier program is an internally developed software program that is used to collate information about all network-related troubles.

The program, which is unnamed, consists of 40,000 lines of code and runs under DOS on an IBM Personal System/2 file server. Members of the network department access the application via an IBM Token-Ring Network.

Each week, trouble ticket information from FPL's host-based help-desk system is downloaded into the program. The program is also used to maintain information gleaned from carrier trouble tickets, including the carrier's trouble ticket number, the source

(continued on page 20)

A carrier performance report

Repair times above 8 hours during the first 6 months of 1991

Service outage date	Jan. 29	Feb. 12	May 17
Repair time	25.33 hours	16.5 hours	68.92 hours
Circuit ID	70FDDA294202	FDPC622808	FDDA458537
Carrier ticket number	FBC24054	20291	FBG91552
Fault category	Termination point	Central office	Interoffice circuit
Fault description	Equipment or carrier failure	Equipment or carrier failure	Cable cut
Resolution description	Adjusted circuit levels at site	Adjusted carrier levels at central office	Repaired cable cut

GRAPHIC BY SUSAN J. CHAMPENEY

SOURCE: FLORIDA POWER & LIGHT CO., MIAMI

FPL's quality control plan betters service

continued from page 19

of the problem, tests performed and information about how the problem was resolved.

Network analysts then review the vendor data to make sure it correlates with FPL's trouble ticket information.

The program is used to crunch the data and generate reports that show the number, source and cause of network problems, overall network availability for the period and service restoral times by carrier. It also portrays in graph form network availability and average service restoral times for the previous six months.

FPL uses the reports as the basis for discussion during biweekly meetings with carrier representatives. It also meets with equipment vendors but on a less regular basis. The firm focuses only on those incidents or problems that fall above or below predefined control limits.

For example, since the average time for carriers to restore data service is six hours, FPL sets a lower control limit of four hours and an upper limit of eight hours. Outages that fall above or below those limits are highlighted in the weekly report and put on the agenda for the vendor meetings.

FPL then asks carriers to explain what caused the outages, the amount of time it took to fix them and, most importantly, their plans for preventing future outages.

Frequently, however, vendors aren't sure what caused specific outages. Some problems simply do not show up in tests. FPL's major carriers consider it normal if they can't identify the root cause of 30% to 40% of all outages, Hicks said.

> "We hate to hear vendors say they don't know what caused a trouble," Hicks said.
>
> ▲▲▲

But not knowing what caused a problem does not pass muster with Stonebraker and Hicks.

"We hate to hear vendors say they don't know what caused a trouble," Hicks said. "We ask them to go back and take a second look."

By pressing carriers and equipment vendors to reexamine problems, FPL has been able to reduce the number of unidentifiable problems to 23% of all incidents reported, well below the 30% to 40% figure vendors claim is standard.

A year ago, for example, FPL discovered an abnormally high failure rate among multipoint data circuits linking the data center here to branch offices throughout the state.

FPL analysts determined the circuits were failing because of a streaming condition, or uncontrolled loop-back transmissions, caused by faulty FPL data service units (DSU).

Whenever the DSUs were turned off by conservation-minded FPL employees, the units would somehow loop back polling messages from the host, clogging the circuit. When the DSUs were turned back on, the problem disappeared.

Properly functioning DSUs should not adversely affect circuits when powered off, so Hicks pointed out the problem to the DSU vendor, which later discontinued the model.

Since then, FPL, which still uses the flawed DSUs, has established procedures to ensure that the DSUs are not accidentally unplugged or turned off during an installation. It also tests new DSUs to ensure they're not susceptible to the same problem.

"Over time, our vendors have learned that our data is accurate and we are doing an honest job at improving their service," Hicks said. "The vendors now depend on [the data we give them] as feedback to improve their own processes." ◪

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INTERNATIONAL NETWORKS

USER STRATEGIES, INTERNATIONAL SERVICES & REGULATION

Worth Noting

Fortune 500 companies had revenues exceeding $2.3 trillion in 1990, or about 11% of the gross world product of $20.3 trillion. Their network service expenditures were estimated to be about $50 billion, or 2% of their revenue, according to Mark Baker, chief executive officer of BT North America, Inc. in San Jose, Calif.

World News

Two leading European user groups, the Confederation of European Computer User Associations and the European Council of Telecommunications Users Associations, recently formed a new user group called the **European Forum of IT&T Users.**

The new group will pursue activities of common concern to both its founding associations, including preparation of user positions on regulations, standards, security and research by the European Community, as well as furthering education and training of computer and communications professionals.

The **Soviet Union** recently became the 121st member of the International Telecommunications Satellite Organization. The Soviet Union became a member of the INTELSAT treaty organization by purchasing an ownership stake of .05% in the group.

Digital Equipment Corp. recently said it landed a one-year contract to service and maintain the multivendor network operated by **Citibank, N.A.'s** Australian division. As part of the deal, DEC will coordinate all service and maintenance activities of Citibank's computer and software suppliers in Australia.

International X.400 links to U.S. carriers

Country	Carrier	X.400 links to U.S. carriers
Australia	OTC, Ltd.	AT&T, MCI Communications Corp., US Sprint Communications Co.
	Australian Telecommunications Corp.	AT&T, MCI, US Sprint
Brazil	Empresa Brasileira de Telecommunicacoes S. A.	AT&T, US Sprint
Canada	Telecom Canada	AT&T, MCI, US Sprint
Chile	Empresa Nacional De Telecommunicaciones, S.A.	US Sprint
Costa Rica	Radiografica Costarricense S. A.	Not offered
Hong Kong	Hong Kong Telecom International, Ltd.	US Sprint
Japan	Ace Telemail	US Sprint
	Kokusai Denshin Denwa, Ltd.	AT&T
Malaysia	Syarikat Telecom Malaysia Berhad	US Sprint
New Zealand	Starnet	Not offered
South Korea	Data Communications Corp.of Korea	AT&T, MCI
Taiwan	Pipmail	US Sprint
United Arab Emirates	Emirates Telecommunications Corp.	US Sprint

GRAPHIC BY MICHELLE BEAULIEU

SOURCE: AT&T, BASKING RIDGE, N.J., AND BP AMERICA, INC., CLEVELAND

Soviet telecom chief enlists U.S. carriers to upgrade net

Visiting official says USSR will permit private nets.

By Ellen Messmer
Washington Correspondent

WASHINGTON, D.C. — On a whirlwind tour through the capital, the Soviet Union's top telecommunications official last week signed four agreements that will affect modernization of the USSR's communications infrastructure.

In his first week here, Gennady Kudriavtsev, minister of communications at the Soviet Union Ministry of Posts and Telecommunications (MPT), also said companies will be allowed to set up private networks in the Soviet Union.

Kudriavtsev concluded a week in which he signed an international gateway switch contract with US West International, Inc., selected US West International and Millicom, Inc. to provide a cellular telephone system in Moscow, agreed to work with AT&T in exploring new communications projects and joined the International Telecommunications Satellite Organization.

The accord with US West International calls for the carrier to finance and operate three new international gateway switches in Moscow, Leningrad and Kiev. The switches are being made in Yugoslavia under license from L.M. Ericsson A/S, a Swedish telecommunications equipment maker.

The Soviet Union currently has only one international gateway, an analog switch located in Moscow. The new switches will provide much needed capacity to handle the growing number of calls to and from the USSR.

Dick McCormick, US West, Inc.'s president and chief executive officer, declined to attach a dollar value to the carrier's investment in the three new Soviet switches. But he said the arrangement will allow US West International to recoup its investment by earning a percentage of the revenue generated by international calls made through the switches.

"We'll be getting 16% annually of those revenues for a period of 15 years," McCormick said.

The Soviets also signed a joint venture agreement with Millicom and US West International to build an analog cellular system in Moscow similar to systems being deployed in Hungary and Czechoslovakia. Export rules currently prohibit the sale of digital cellular systems to the Soviet Union, a US West spokesman said.

In addition, the Soviets signed a memorandum of understanding with AT&T to explore new communications services there. "It could mean anything," an AT&T spokesman said.

AT&T said it plans to open its first office in the Soviet Union later this year in Moscow.

(continued on page 22)

U.K. ends restrictions on private-line resale

Users, service firms may now resell dedicated int'l capacity, but switched services prohibition stays.

By Barton Crockett
Senior Editor

LONDON — Partially fulfilling its pledge to allow full competition among carriers, the U.K.'s Office of Telecommunications has ended all restrictions on resale of dedicated capacity from international private lines.

As of June 28, users and network service providers in the U.K. have been able to sublease dedicated capacity from international private lines to other organizations without restriction.

Previously, the U.K. prohibited users and providers from reselling dedicated capacity to third parties if voice or telex traffic was routed over the subleased circuit.

This move satisfies part of a policy pledge the U.K. made earlier this year when it published a white paper that called for full competition in the country ("U.K. embraces plan for full competition in net arena," *NW,* March 11).

Among other things, the white paper suggested that unfettered international resale should be allowed, at least between the U.K. and other countries that permit international resale.

Many observers say resale could benefit users by enabling service providers to leverage economies of scale from high-bandwidth international private lines to sublease dedicated and switched services to users at a discount over current tariffs.

But the U.K. has yet to follow through on another pledge in the white paper to allow resale of international switched services via private lines. The U.K. bans users and resellers from routing voice traffic from the U.K. end of an international private line into the public switched telephone network in the U.K.

Only the foreign end of an international private line used by resellers can be linked to the public switched network. Critics say this means that the U.K. is holding back on its promise to allow full domestic and international competition.

(continued on page 22)

AT&T unit wins Brazilian VSAT equipment contract

By Barton Crockett
Senior Editor

BELO HORIZONTE, Brazil — AT&T Tridom last week said it has landed a contract to supply very small aperture terminal satellite earth stations for the first privately owned, shared-hub VSAT network in Brazil.

The VSAT net, which is already partially operational, links offices of the Brazilian state of Minas Gerais to a VSAT hub here.

Currently, the VSAT net serves only Minas Gerais and is owned by Prodemge, a state-run data processing organization. But Jim Stratigos, marketing vice-president for the AT&T VSAT unit, said the government recently gave permission to other users to tap into the network.

He said other users could link up to the net by purchasing a remote earth station from AT&T Tridom. The earth station would send data to the central hub, also supplied by AT&T Tridom.

Stratigos noted that this VSAT net could be an attractive alternative to terrestrial facilities that are often of poor quality or nonexistent in Brazil. He added that joining a shared-hub net could be less expensive than setting up a private VSAT net.

According to Brazil's state-owned monopoly carrier, Empresa Brasileira de Telecommunicacoes, S.A. (Embratel), the Prodemge network is the first privately owned, shared-hub VSAT network in the country.

Stratigos said that approval of the shared-hub VSAT net is one sign, among many, that the restrictive regulatory system in Brazil is liberalizing.

According to Stratigos, import duties of up to 200% are levied on AT&T Tridom VSAT earth stations in Brazil. Embratel said users pay about $10,000 per month for service to 10 VSAT earth stations on the Prodemge net and $100 per month for each additional earth station. Usage fees of one cent per 1,000 bytes of data are also levied after 16,500 bytes of data are transmitted.

Soviet telecom chief enlists U.S. carriers

continued from page 21

At week's end, the Soviet Union joined INTELSAT and became the international satellite consortium's 121st member. The historic treaty officially ends several decades of isolation and allows the Soviets to participate as a minority owner in future INTELSAT decisions and possible satellite launches.

An INTELSAT spokesman said the organization will send earth station technical specialists to the USSR under the signatory development program.

The treaty falls short of combining Intersputnik, the Soviet satellite system, with INTELSAT, a subject of speculation for some time. But Kudriavtsev said the Soviet Union is still interested in exploring an INTELSAT/Intersputnik merger.

Last week, Kudriavtsev emphasized the enormous burden of bringing the Soviet telecommunications systems up to par with the West.

"We are facing a lot of problems today in our country," Kudriavtsev said through a translator. He pointed out that the Soviet government recently concluded it must spend 100 billion roubles over 10 years to install the telephone lines needed by its citizens.

Kudriavstev said he will meet this week with Bradley Holmes, the U.S. Department of State's coordinator and director of the Bureau of International Communications and Information Policy, to arrange a trip to the Soviet Union in September for U.S. telecommunications firms interested in the Soviet development program.

Kudriavtsev also said that although the Soviet government recently decided not to privatize its current telecommunications facilities, it is willing to privatize facilities built in the future. Specifically, he said he is now prepared to issue certificates for private networks in the Soviet Union.

"Our only requirement as the MPT for a company doing business in that field is that equipment must be sophisticated and modern," Kudriavtsev said. "We will now allow 100% privately owned networks in the Soviet Union." ■

U.K. ends restrictions on private-line resale

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These concerns have been fueled by government statements that the U.K. doesn't want competitive carriers to offer only international services, but domestic services as well.

Charlie Meyers, an AT&T manager for international policy, said this stance could simply be a ploy to keep competitors from attacking the U.K.'s most profitable network market — the provision of international services.

"I don't think they want to do anything that would hurt British carriers by letting someone cream skim their lucrative international markets," Meyers said.

At a minimum, the U.K.'s reluctance to fully legalize international switched service resale is emblematic of the difficulty regulators worldwide face in trying to allow international switched service resale via private lines.

Currently, the U.S. has no restrictions on international resale, while Australia is moving to legalize it. Other countries, including Japan, may legalize international resale in the future.

The problems regulators face in legalizing service resale fall into two categories. The first arises from most countries' desire to only allow international resale to countries that offer equivalent access to their network markets.

Regulators are finding it difficult to define exactly what equivalent access means. For example, the U.K. is considering not allowing international switched service resale to the U.S. until the U.S. ends all foreign ownership restrictions on American carriers, according to a source within the U.K.'s Office of Telecommunications who requested anonymity.

The U.K. currently has no foreign ownership restrictions, and many officials believe it is unfair that the U.S. maintains them. The other problem concerns the effect international resale could have on dominant carriers.

Currently, most international carriers earn huge profits on international switched services, which, by most estimates, are priced far above provisioning costs. Thus, international switched service resellers would be attacking vital revenue streams.

Gregory Staple, an attorney specializing in international communications with Koteen & Naftalin, a Washington, D.C. law firm, said regulators are concerned that carriers from countries that don't allow international resale would resell services between countries that permit it and thereby enter a foreign market while continuing to enjoy a domestic monopoly.

"I think the regulators are going to find this quite a difficult issue," Staple said.

WorldCom moves ahead

Meanwhile, at least one international carrier, World Communications, Inc. in New York, is moving to take advantage of the U.K.'s modest liberalization of international resale rules.

George Frylinck, WorldCom's senior vice-president for marketing and sales, said the carrier has leased capacity between Frankfurt, Germany, London and New York and is subleasing dedicated capacity from these circuits to users for data and voice services. The recent regulatory change in the U.K. enabled WorldCom to do this for the first time. ■

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6. Personal involvement in the purchase of bridges, routers gateways/wide-area networks.
7. Personal involvement in the purchase of private networks.

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9. Multi-department LANs currently in use at location.
10. Modems under 9600 BPS planned for purchase over the next 12 months.
11. Protocol converters planned for purchase over the next 12 months.
12. Wide-area networks currently in use at location.
13. Wide-area networks planned for purchase over the next 12 months (tied for first).
14. Bridges, routers or gateways planned for purchase over the next 12 months.
15. T-1 or T-3 networks currently in use at location.
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20. 1,000 or more employees in organization.
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PRODUCTS & SERVICES

THE LATEST OFFERINGS FROM VENDORS AND CARRIERS

First Look

Ashton-Tate upgrades dBase Direct for 3270

Ashton-Tate Corp. last week unveiled a new version of **dBase Direct for 3270,** which enables dBase users to emulate IBM 3270 terminals to access data on IBM System/370 mainframes.

Version 1.01 of the software supports 3270 mainframe access for dBase IV Version 1.1 users as well as dBase III Plus, which the product previously supported.

The software, which resides on a personal computer, allows users to build a series of sequences to access and retrieve data residing on mainframes, transfer files between a personal computer and a host, or read selected fields within 3270 applications.

The vendor said dBase Direct for 3270 Version 1.01 costs $595 and is available now. Current users may upgrade for $35.

Ashton-Tate Corp., 20101 Hamilton Ave., Torrance, Calif. 90509; (213) 329-8000.

Retix unveils X.400 gateway for Microsoft Mail

Retix last week unwrapped a gateway that links Apple Computer, Inc. Macintosh users on Microsoft Corp. Mail networks to X.400 backbones.

Called the **Microsoft Mail Gateway to X.400 for Macintosh,** the gateway enables Microsoft Mail users to transparently send and receive electronic mail messages to users on attached X.400 networks. Users can share E-mail with users on mainframe-based systems, as well as public X.400 services.

Microsoft Mail Gateway to X.400 for Macintosh costs $1,795 and will ship by the end of September.

Retix, 2644 30th St., Santa Monica, Calif. 90405; (213) 399-2200.

NetPlus Software offers Task Server for NetWare

NetPlus Software, Inc. recently announced **OnQueue Task Server,** software that provides users on Novell, Inc. NetWare LANs with the ability

(continued on page 26)

Innosoft upgrades PMDF to support compound E-mail

Upgrade also provides improved performance.

CLAREMONT, Calif. — Innosoft International, Inc. recently announced enhancements to its PMDF electronic mail distribution system that enables it to support compound documents and improve message delivery in Digital Equipment Corp. DECnets.

PMDF Version 4.0 is VAX-based software that supports DEC's VMSmail and All-In-1 by serving as a store-and-forward E-mail utility that accepts incoming messages from a variety of users and passes them to a recipient. If the message does not get through, PMDF keeps trying until it is delivered.

Version 4.0 of the software allows PMDF to support nontext messages. This enables PMDF to support the transfer of compound document E-mail messages — such as computer-aided design and manufacturing files, bills of materials and executable programs — from VMSmail or All-In-1 users to E-mail users on the Internet, Bitnet and other networks.

DEC's competing Message Router, by contrast, only supports message routing within DECnets and does not support E-mail messages containing compound documents.

According to Kevin Carosso, vice-president of engineering at Innosoft, the company is supporting an unnamed draft Internet standard for multimedia and multipart E-mail. "This standard describes how to encode objects such as a picture into an E-mail message," he said.

Innosoft also claimed it had improved the performance of its PMDF software, although Carosso said performance gains vary widely according to the amount of E-mail traffic handled by PMDF.

Basically, the vendor reworked PMDF to hand off message batches to VMSmail or All-In-1 in a single burst. Previously, VMSmail would only accept one message at a time, which meant PMDF had to establish separate sessions with VMSmail or All-In-1 for each message, Carosso said.

Considering that it takes about two seconds to initate a session with VMSmail or All-In-1 on a VAX, he said the multiple mes-

(continued on page 26)

Software lets VINES users tap VAX as net file server

FORT COLLINS, Colo. — Digital Area Networks, Inc. recently announced MAXLink VAX FileWay for Banyan VINES, software that enables users on Banyan Systems, Inc. VINES LANs to use Digital Equipment Corp. VAXes as network file servers.

The software, which resides on DEC VAXes and VINES servers, supports bidirectional file transfer so VINES client workstations can access data stored on VAX disk drives and VAX users can retrieve files stored on VINES servers. The software provides VINES users with peer access to VAX servers, eliminating the need to set up VT terminal emulation sessions to access the host.

"Most PC users don't want to learn complicated terminal emulation programs or switch LANs simply to exchange files with their corporate VAXes," said Max Eidswick, Digital Area Networks' president and chief technical officer.

MAXLink VAX FileWay for Banyan VINES allows VINES clients to move files from VINES server drives to VAX disks and back without setting up individual file-transfer sessions.

Instead, when a user stores a file, the software automatically keeps a table of the VAX drive where it resides and writes the file to that location. Therefore, when a user calls a file, the software knows where the data is stored and accesses it.

VINES users must have security access to the requested VAX file and server logical drives before file transfers can occur.

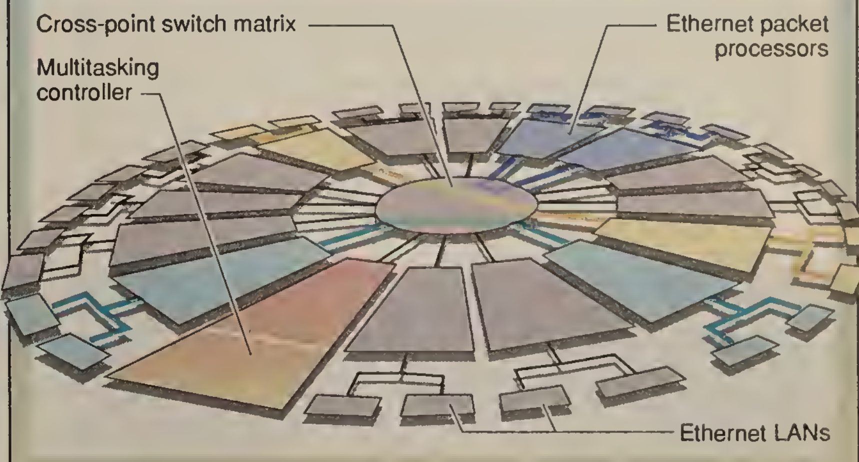
"In effect, our FileWay software acts as a transport agent for files, moving files to a predetermined VAX storage location or a specified drive," Eidswick said.

Once the MAXLink software is installed, VINES users do not have to learn new commands to access VAX data. They simply use the existing VINES SETFILE command to request a periodic file update or the GETFILE command to immediately request a file.

FileWay user names — which are assigned by a local-area net-

(continued on page 26)

Circuit-switched hub links Ethernets



The EPS-1500 EtherSwitch, which can support as many as 7 simultaneous connections between attached Ethernet LAN segments, reads the destination address of each packet and establishes the circuit between the segments as needed.

GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: KALPANA, INC., SAN JOSE, CALIF.

Switch for Ethernet opens new frontiers

High end of Kalpana line supports up to 14 nets, simultaneous connections between any seven.

SAN FRANCISCO — Kalpana, Inc. recently introduced a 15-port version of its EtherSwitch, a circuit switched hub capable of supporting as many as 14 Ethernet local-area network segments and maintaining simultaneous 10M bit/sec conversations between any seven segment pairs.

Like the earlier seven-port EPS-700, the EPS-1500 EtherSwitch uses a telephone switch-like matrix to establish links between ports as needed.

The device can be used in a number of configurations — such as a high-performance front end for a file server or as hubs in a cascaded network — in order to provide increased network throughput and better server performance compared to standard or bridged and routed network configurations.

The EPS-1500 comes with eight Ethernet Packet Processors (EPP) and a multitasking system module.

The hub can be outfitted with six additional EPP network connections, each of which has enough on-board memory (512K bytes of random-access memory) to retain about 4,000 active Ethernet addresses.

One of the key attributes of the EtherSwitch is its ability to switch packets on the fly.

"Unlike a bridge or router, which must buffer an entire packet before forwarding it, the EtherSwitch forwards a packet to the appropriate output port based on its header's six-byte destination address," the company reported.

The typical port-to-port delay of the EtherSwitch is about 40 microsec compared to 800 microsec for bridges and 1,800 microsec for routers, according to the company.

The EtherSwitch EPS-1500's 100% filtering and forwarding ability means the device can forward a continuous stream of back-to-back packets without losing a packet. This amounts to a forwarding rate of 14,880 packet/sec, nearly the speed of Ethernet.

"Consequently, servers need not be placed on the same segment as the workstations they serve," the company said.

Besides providing flexibility in terms of server location, the low switching delays make it possible to create cascaded network configurations in order to enhance the throughput of work group LANs.

For example, the switches can be used to improve the performance of LAN configurations where three or more LAN segments, each of which supports workstations and multiple servers, are linked via an Ethernet backbone.

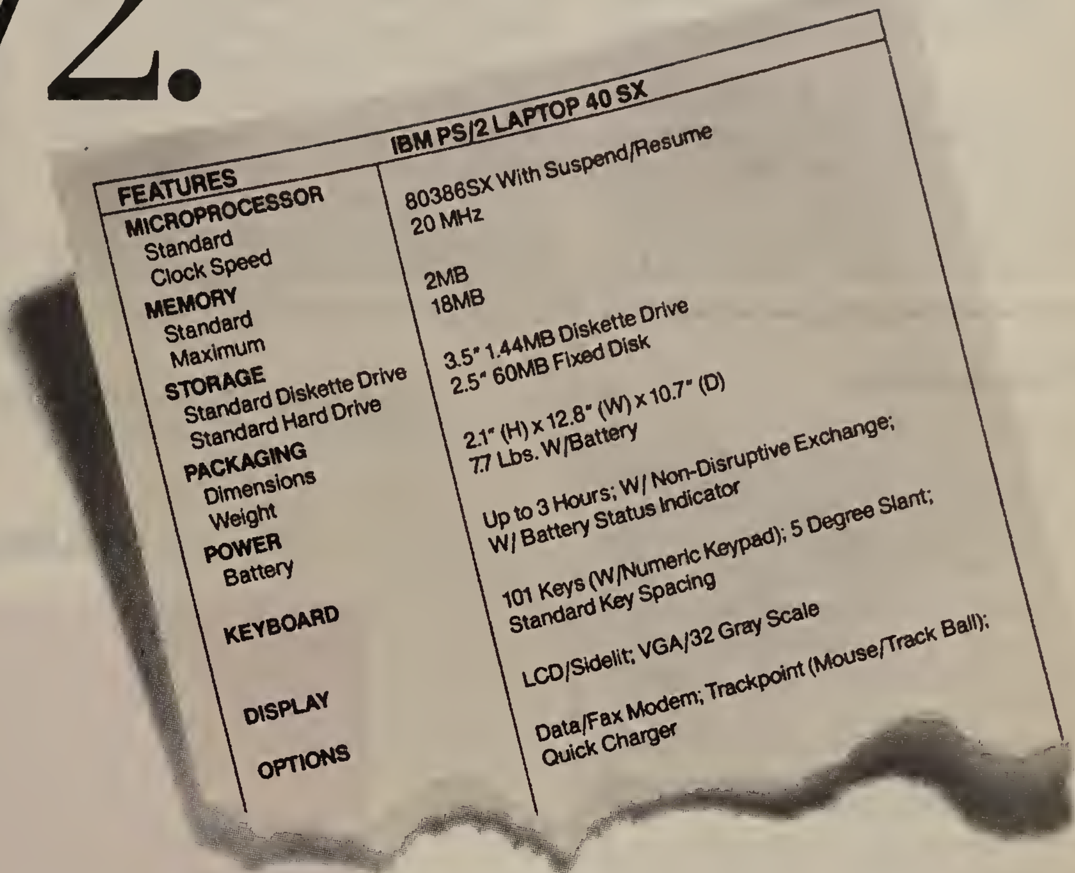
In addition to requiring careful network planning to minimize traffic problems on each LAN segment, contention for the backbone in this configuration could restrict communications between the segments.

Installing EtherSwitches in each work group LAN makes it possible to attach servers directly to the switch and add new LAN segments for workstations, thereby increasing server availability by allowing the network to support multiple concurrent connections.

(continued on page 26)

The body of
The heart and

a laptop.
soul of a PS/2.



FEATURES	IBM PS/2 LAPTOP 40 SX
MICROPROCESSOR	
Standard	80386SX With Suspend/Resume
Clock Speed	20 MHz
MEMORY	
Standard	2MB
Maximum	18MB
STORAGE	
Standard Diskette Drive	3.5" 1.44MB Diskette Drive
Standard Hard Drive	2.5" 60MB Fixed Disk
PACKAGING	
Dimensions	2.1" (H) x 12.8" (W) x 10.7" (D)
Weight	7.7 Lbs. W/Battery
POWER	
Battery	Up to 3 Hours; W/ Non-Disruptive Exchange; W/ Battery Status Indicator
KEYBOARD	101 Keys (W/Numeric Keypad); 5 Degree Slant; Standard Key Spacing
DISPLAY	LCD/Sidelit; VGA/32 Gray Scale
OPTIONS	Data/Fax Modem; Trackpoint (Mouse/Track Ball); Quick Charger

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Making a computer light enough to take anywhere and small enough to sit on a lap isn't enough. Making it perform like one that sits on a desk is the true challenge. That's why IBM has created a computer that delivers true portability without sacrificing true performance—the Personal System/2® Laptop 40 SX. At just 7.7 pounds it's clearly a lightweight computer. But it certainly doesn't act like one.

DESKTOP PERFORMANCE, WITHOUT THE DESK.

The PS/2® Laptop looks great from the outside. But its true beauty lies inside, where you'll find uncompromised computing power. It has the same 386SX™/20 MHz processor found in best-selling desktop models. A 3.5″ 1.44MB disk drive and 2.5″ 60MB fixed disk provide fast access to programs and data, and standard 2MB RAM is expandable to 18MB.

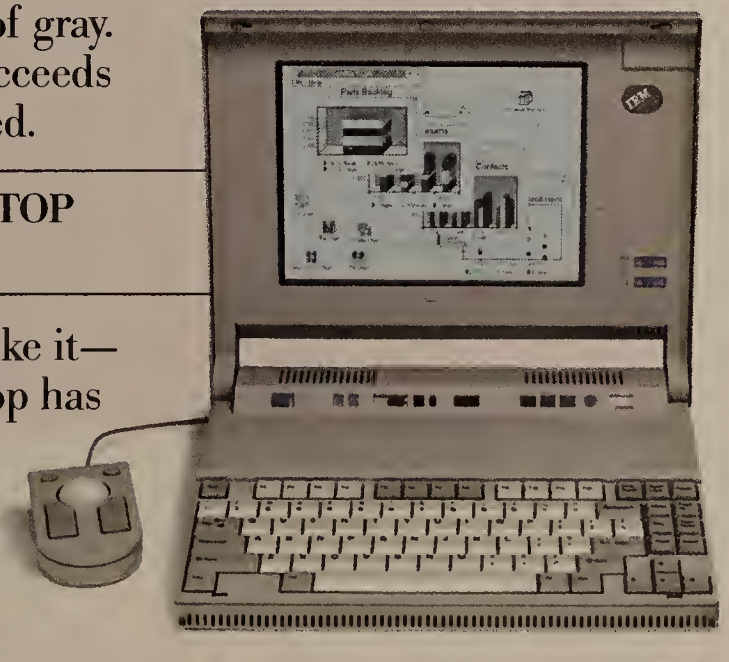
Instead of compromising comfort by altering the keyboard, the PS/2 Laptop has a full-size keyboard spaced and arranged the same way as a desktop PS/2's. And instead of squeezing information onto a pint-size screen, it has a sidelit LCD that offers a 10″-diagonal viewing area. It delivers sharp, clear text and graphics with VGA quality in 32 shades of gray. With so much to offer, the PS/2 Laptop succeeds at being small, without being small-minded.

THE PS/2 LAPTOP IS ONE LAPTOP NOT TO BE TAKEN LIGHTLY.

IBM knows it's not how small you make it—it's how you make it small. The PS/2 Laptop has system status icons that monitor assorted functions and battery life. Extensive power management controls include the ability to change batteries in the middle of an application without exiting and a special feature that suspends power when the screen is closed, then returns to full power when reopened, resuming applications where they were left off without the need to save to the hard drive.

Of course, it comes with an AC adapter, and a 2400 BPS Data Modem/9600 BPS Fax Modem is available, as well as a special mouse that doubles as a trackball when turned over. And the PS/2 Laptop comes with something no laptop should be without—an international warranty* backed by thousands of Authorized Remarketers worldwide, so service and support are never far away.

To find out more, contact your IBM Authorized Remarketer or IBM marketing representative. You'll see why with the new PS/2 Laptop, you don't need a whole lot of room to get a whole lot of computer.



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PMDF to support compound E-mail

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sage feature will result in considerable performance improvements for users with large amounts of E-mail traffic.

Carosso pointed out that Innosoft also rewrote the software's I/O handling so that message files are dispatched from store-and-forward queues in shorter time frames.

Another new feature in PMDF is Deliver, a programmable E-mail screening tool similar to capabilities announced by Beyond, Inc., a Cambridge, Mass., E-mail start-up. Innosoft previously offered Deliver as a separate option but built the feature into PMDF to improve message screening performance. Using Deliver, incoming E-mail can be automatically sorted, filed, returned and prioritized according to preprogrammed instructions.

PMDF now comes with support for private alias data bases, enabling end users to create and use their own list of private aliases for E-mail addresses. Rather than keying in a complex E-mail address, users can assign simple name identifiers and key in those names to send a message. Previously, aliases were kept in a central data base and end users had to request a systems manager to update or add an alias.

Lastly, Innosoft enhanced PMDF-FAX, an E-mail gateway that delivers messages via a facsimile. Running within PMDF 4.0 environments, the gateway now supports a pop-up window, allowing VMSmail or All-In-1 users to send fax messages from within their local E-mail applications. PMDF-FAX supports plain text and PostScript files.

PMDF Version 4.0 runs under VMS Version 5.2 or above. Pricing is based on annual subscription rates in which users pay for a service bundle that covers the cost of software for various processors. Subscriptions cost $960 per machine for the first bundle and $480 for each additional bundle. PMDF-FAX costs $960 per machine.

For further information, contact Innosoft at 250 W. First St., Suite 240, Claremont, Calif. 91711, or call (714) 624-7907.

Switch for Ethernet opens new frontiers

continued from page 23

Moreover, attaching each work group EtherSwitch with a fourth switch sitting on the backbone improves segment-to-segment throughput and virtually eliminates contention for the backbone, according to Kalpana.

Similarly, the switch can be used in a stand-alone fashion to provide improved throughput to servers by connecting them individually to EtherSwitch ports and using the other switch ports to support LAN segments populated with workstations.

The EPS-1500 supports 10Base2, 10Base5 and 10BaseT cable options and

First Look

continued from page 23

to off-load programs from client workstations to a dedicated applications server.

OnQueue Task Server enables a user to set up an IBM Personal Computer as a dedicated applications server capable of handling tasks such as data base searches, language compilations and scientific calculations.

The package consists of two software modules. One module, the OnQueue Task Console, is installed on a client workstation and allows users to send tasks to a Task Server.

The other module is installed on a personal computer dedicated as the Task Server and processes task requests. OnQueue Task Server software is available now for $495.

NetPlus Software, Inc., 47 Wake Robin Road, Sudbury, Mass. 01776; (508) 443-6043.

Software lets VINES users tap VAX

continued from page 23

work administrator — associate VINES users with VAX/VMS user names. Those user names are then associated with VAX security and file access privileges.

VAX users can also extend their file access to VINES servers. After a FileWay logon, a VAX user must request the specific VINES logical disk, StreetTalk name, full file path and full destination path in order for files to be transferred.

MAXLink VAX FileWay for Banyan VINES must reside on at least one VINES LAN personal computer, where it is dedicated to FileWay operations. The software requires users to run VINES 3.0 or above. The dedicated FileWay personal computer must reside on a DOS-based VINES client workstation with at least 10K bytes of free memory and one half-card 8-bit slot available for a MAXLink VAX Ethernet LAN card. The DEC VAX software must run on a processor supporting VMS Version 4.4 or above and use 2M bytes of memory and 1M byte of disk storage for MaxLink FileWay programs.

MAXLink VAX FileWay for Banyan VINES is available now. The add-on modules that reside on VINES cost $795; VAX server software ranges in price from $995 to $7,500, depending upon processor model.

For further information, contact Digital Area Networks at 2301 Research Blvd., Suite 110, Fort Collins, Colo. 80526, or call (303) 484-2400.

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1988 *Sprint completes the only nationwide 100% digital fiber optic network. Sprint awarded 40% of FTS 2000 contract.* 1989 *World's first and largest privately-owned*

fiber optics. It operates at the media access control layer and is transparent to higher level protocols.

Available as a no-cost option is support for the Simple Network Management Protocol (SNMP), which enables customers to remotely monitor activity levels, perform diagnostics and enable or disable units on a port-by-port basis from SNMP management stations.

An eight-port EPS-1500 costs $12,995, and a fully configured 15-port model costs $19,995. EPP modules cost $1,000 each.

The product is expected to be available mid-August.

For further information, contact Kalpana at 125 Nicholson Lane, San Jose, Calif. 95134, or call (408) 428-1150. ◼

Managers must keep trials in perspective

continued from page 19

trial it. The network manager is allowed to expend considerable staff resources on the trial because of its tremendous potential to improve the financial health of the company.

Unfortunately, the trial gets off to a rocky start. The sites selected as guinea pigs for the trial experience line problems soon after the cutover is complete. In addition, the network control staff complains that the new carrier lacks adequate help desk procedures and is slow to respond to calls to fix downed or impaired circuits.

While the net manager admonishes the new carrier to improve, other fissures appear. The carrier displays only a mediocre ability to identify and resolve line troubles, while poor circuit quality degrades network response times.

As the trial proceeds, senior management asks the net manager for updates. Since the trial has not produced any disastrously bad results, the manager is cautiously optimistic and says the trial is showing some promising results. This brings smiles from the senior staffers, who mention what a great idea it was to test the service and how hopeful they are that the trial succeeds.

But in reality, things aren't going so well and the network manager is having a hard time facing up to it. The manager knows what the senior executives want to hear and yearns to bask in the glory of saving the company lots of money. On the other hand, the manager realizes that the new carrier really doesn't have a chance of measuring up to expectations.

At this point, it would be easy for the manager to discount complaints from users and others, maintaining that people always have a difficult time adjusting to change and that the new carrier is working hard to improve service.

Reluctant to admit the pilot test has yielded disappointing results, the net manager could easily decide to override user objections and press ahead with the recommendation to convert to the new network carrier.

Network managers need to conduct pilot tests with as much detachment as possible. They need to establish stringent, tangible performance standards so they can remain objective and focused. They need to keep their egos in check and sort out the difference between what they want and what the test results indicate they should do.

To react differently would be perilous. Network managers who lose their objectivity and start cheering on a trial vendor can seriously undermine their credibility and chances for career advancement. ◼

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transatlantic fiber optic cable completed. 1990 *Sprint announces the first commercial video services to the Soviet Union. Sprint introduces first nationwide ISDN capabilities.*

Feedback essential in keeping user loyalty

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technically sophisticated than they were five years ago, and they have much higher expectations of the MIS department."

The Travelers recently surveyed users during a two-month period to measure how satisfied customers were with the company's computing and network services. Those results showed that internal service standards needed to be sharpened in order to satisfy greater user expectations.

"We found that some of our standards, such as turnaround time for a particular job, did not meet user demands, so we're setting higher standards for ourselves," Murray said. "Customers are saying, 'We want it done faster, we want it to cost less, and we want you to better understand our business requirements.' "

Keeping competitive

According to Charles Snell, director of computing and communications at Harris Corp. in Melbourne, Fla., net managers will be compelled to improve customer service as more firms look to outsourcing as a way of cutting costs and reducing overhead. Providing optimal service to satisfied customers is the best way to stave off an outsourcing threat.

"In today's environment, we have to get out and ask users what they want, rather than assume we're giving them the solution we think they need," he said. "Managers that rely on the old method are putting themselves in danger."

Snell now uses quarterly surveys to measure customer satisfaction and regularly compares his service and pricing against those of outsourcing vendors.

"In today's competitive environment, our department can no longer dictate as it did in the past," he said. "We succeed when we ensure that the user is getting the same or better service from us at a lower cost than they would from any other outside source." ◼

OPINIONS

CALL AGGREGATORS

BY EDWARD HORRELL

Beating the aggregators at their own game

For some time now, resellers of certain long-distance services have been referred to facetiously as "aggravators" because they aggregate traffic from several low-volume users and dump it onto a carrier's network in order to obtain otherwise unavailable volume discounts. This practice aggravates carriers because it hinders their ability to service customers with the volume needed to obtain discounts.

Aggregators amass traffic from groups, associations, distributors and any other loosely affiliated organizations. The individual members of such groups, not the aggregator, are responsible for guaranteeing that the volume is high enough to ensure the discount. In other words, the aggregator commits to the service but the group is responsible for delivering the traffic to the aggregator.

> DNS is the first serious attempt by AT&T to get rid of or control aggregators.
>
> ▲▲▲

There are three good reasons for users to sign on with an aggregator: price, price and price. No other reason exists.

A few years ago, AT&T introduced volume discounts for users with multiple locations, as well as a virtual network service, again for large customers, called Software-Defined Network (SDN), which allows them to take advantage of volume discounts. Smart aggregators realized that with this setup, they could combine traffic from smaller, unrelated firms and become, from a pricing standpoint, one large customer.

Volume discounts, coupled with SDN, should have been a good deal from all points of view. But it wasn't. What AT&T quickly discovered was that aggregators were calling on existing AT&T customers and converting them to its service by offering lower rates than they could get with volume discounts. AT&T's account executives actually watched their revenue base dissolve, while they were forced to support their new competition.

Adding to the confusion was the fact that many aggregators were staffed with inexperienced marketing and support people, which caused further problems for both AT&T and its users. Finally, the constant churning of AT&T's long-distance network caused by so many small companies signing up for SDN service made signing up large users, whose traffic was better suited to SDN, practically impossible. Both AT&T and its SDN customers became concerned. SDN should have been for large users, but instead it became a tool for money-makers and a pain in the neck for legitimate users. However, this has changed.

AT&T recently introduced a new product — Distributed Network Services (DNS) — designed specifically with aggregators in mind. Basically, DNS offers a better off-peak discount than AT&T's new SDN tariff, which is more appealing to smaller users. Although it may be confusing for some users, DNS is the first serious attempt by AT&T to either get rid of or control aggregators.

Users that are looking to switch long-distance service should pay close attention to the objective that they hope to accomplish. One short-term effect of DNS could be numerous failures in the aggregator market as the dominant carriers begin to offer lowered rates for smaller users, such as MCI Communications Corp.'s Preferred Service, in an effort to further curtail the activities of aggregators.

It could be that aggregators' days are numbered. And that development wouldn't be all that bad.

Horrell is president of The Horrell Consulting Firm, Inc. in Memphis, Tenn.

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EDITORIAL

The benefits that extensive networking could bring

Network managers have often been described as crucial to the corporate organization. Small potatoes when you consider the possibility that networking skills may be crucial to the health of communities, the country, even the planet.

Science fiction? Maybe not. This larger picture outlook is what's behind the current government policy discussion about substituting telecommunications for transportation.

One report, prepared earlier this year by Arthur D. Little, Inc., a Cambridge, Mass., consultancy, speaks of $23 billion in annual benefits to the U.S. economy and nearly two million fewer tons of noxious fumes and carcinogenic particles in the air each year — all from a more extensive use of teleconferencing, telecommuting and other networking techniques.

Surely with such potentially overwhelming national consequences, network managers should pay attention to this debate. After all, how often does one get the chance to simultaneously help their firm, their nation and even their world?

For about a year now, President Bush has been pushing telecommuting. Several state governments have held hearings or set up advisory committees on telecommuting. In June, California's state assembly voted for a matching grants program to help fund telecommuting trials.

Because the Arthur D. Little report was mainly funded by five of the seven regional Bell holding companies, users should treat its conclusions with some skepticism. Its $23 billion figure is surely exaggerated because it does not include the cost of telecommunications services.

Still, the report points to a fact that has not been given much consideration until now: The intelligent use of networking in national and local transportation strategies could save fuel and reduce pollution.

Consider how using the projected 3.5 billion fewer gallons of gasoline each year would help improve the U.S. trade balance. Consider how reducing pollution by 1.8 million tons per year would benefit the health of the American people, not to mention the effect of less acid rain on the environment.

Now networking professionals have something to add to a national policy discussion, and there's much they can contribute. They can stress, for example, the need for Integrated Services Digital Network in making inexpensive, high-speed circuits available to workers at home.

And when communities debate incentives to encourage companies to implement telecommuting and teleconferencing, network managers surely should get involved.

OPINIONS

Is outsourcing a savvy move for users?

PRO:

By THOMAS MANGAN

Communications managers and their staffs are faced with a never ending dilemma: How can they develop far-reaching creative and strategic applications when they must spend the vast amount of their time monitoring the day-to-day operations of data communications networks.

Many are turning to outsourcing — assigning the implementation, management, expansion and daily operation of their data networks to an outside vendor with the expertise and services to meet their company's communications needs.

Outsourcing allows data communications executives to concentrate on developing strategies that support corporate objectives. Outsourcing vendors serve as an extension of corporate staffs, monitoring daily network operations, evaluating network traffic loads, and anticipating service upgrades and expansions necessary to meet the company's growth. They relieve staff of the time-consuming daily activities involved with keeping the corporate data communications network running smoothly and reliably.

Not only does outsourcing free a company's key strategic thinkers to do what they do best — develop innovative ways to use data communications and design network upgrades to sustain continued growth — but it also saves the company money. According to The Yankee Group, a Boston-based consulting and research group, companies that outsource management of their networks can achieve savings of as much as 25%.

Looking at the benefits in cost savings, reliability and strategic use of personnel, it's easy to see why companies such as Eastman Kodak Co. and Minolta Camera Company, Ltd. have joined the trend to outsource responsibility for modifying, monitoring and managing their nets.

Fear of losing control should not prevent network managers from outsourcing; the outsourcer

(continued on page 43)

Mangan is vice-president of marketing for Cylix Communications Corp., a Memphis, Tenn.-based network management and data communications company that provides data network outsourcing services.

CON:

By JAMES CARLINI

Outsourcing is the new management watchword at many financial institutions, insurance companies and other organizations. It is the darling of some financial officers' solutions for cutting costs and salary expenditures. Their shortsighted management philosophy is to identify short-term savings, which are good only for short-term salary bonuses.

What most of these number crunchers fail to put into their formula are the long-term effects of outsourcing. Sure, from a short-term standpoint there will be some cost savings, but what about long-term strategies and future expenses?

If you get rid of all the systems expertise within the organization, you put it at the mercy of the third-party vendor. During the first year or two, you will see substantial savings. But what happens when outsourcing fees start to creep up and service deteriorates? What if the fees double?

Selective outsourcing, which occurs when only certain applications are given to a third party, has become the next refinement of this concept. Some executives have given outsourcing some serious thought before embarking on a program and have discovered that it is not such a universal solution for every application.

If you outsource everything, then it becomes extremely difficult to measure the managerial effectiveness of your third-party vendor. How do you know you're getting your money's worth? How can you accurately measure network performance? You have to keep some staff on payroll just to manage and monitor the outsourcer.

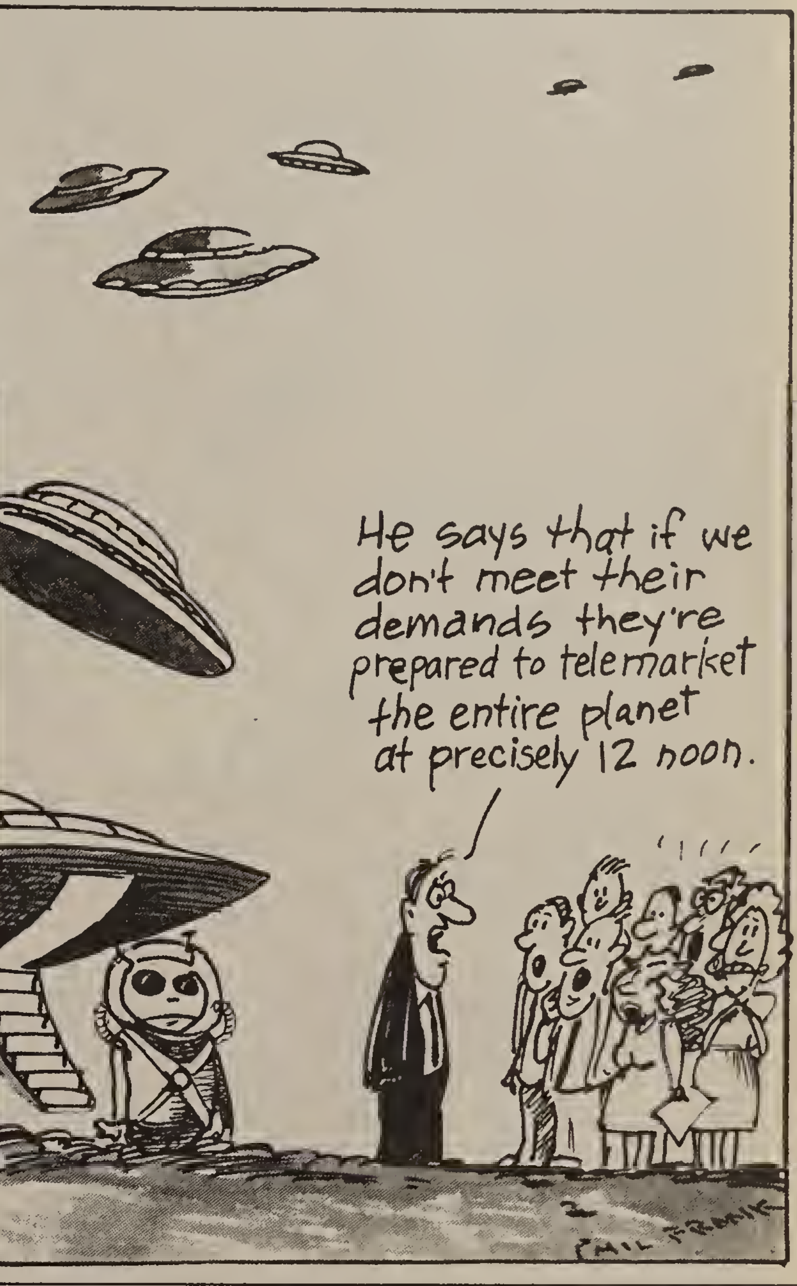
If you decide to outsource, make sure applications that the outsourcer handles are mundane, not mission-critical. Not all applications are candidates for third-party management. Some applications, such as bank loans and savings accounts, might involve information that is too sensitive to give to a third-party outsourcer. How do you en-

(continued on page 43)

Carlini is president of Carlini & Associates, Inc., a management consulting firm in Hinsdale, Ill. He also lectures on information technology at Northwestern University in Evanston, Ill.

TELETOONS

BY FRANK AND TROISE


He says that if we don't meet their demands they're prepared to telemarket the entire planet at precisely 12 noon.
PHIL FRANK

LETTERS

Industry solution needed

The recent telecommunications outages reported in your articles "CCS7 woes fuel outages for 2 telcos" (*NW,* July 1) and "Telecom SWAT team tackles CCS7 mystery" (*NW,* July 8) are part of a problem I first reported at conferences and seminars in the early 1980s.

As GTE Corp.'s technical director for the design and implementation of a large private network, I discovered the problem. However, when I presented it at industry meetings, the reaction from the carriers' traditional telecommunications staff in the audience was incredulity. They contended it could never happen to them.

Today's network is a massive, complex distributed process control system and includes all the advantages and disadvantages of one. In these systems, even small, internal malfunctions, untested usage patterns or other events can cause instabilities with catastrophic results.

Unfortunately, how these systems will perform under

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Packet networks of the future

CONTINUED FROM PAGE 1

Now the rise of distributed computing and local-area networks is spawning a second packet era. Packet transmissions are ideal for conveying bursty data and thus can be used to form high-speed links between LANs.

However, this new era requires more than plain old packets. For connecting Ethernets and potentially 100M bit/sec Fiber Distributed Data Interface LANs, wide-area data rates have to approach those speeds. Standard X.25 packet switching, which usually runs at 64K bit/sec, is no longer fast enough. Instead, a new and more powerful generation of packet-switching technologies has arisen that promises to play an important role in user networks.

These include: frame relay, a network access technique that transmits data packets of variable lengths with a minimum of error checking; and cell relay, a packet transmission technique for voice, data and video that uses short fixed-length cells.

Cell relay encompasses: Asynchronous Transfer Mode (ATM), a standard that breaks voice and data into 53-byte cells; Switched Multimegabit Data Service (SMDS), a public, high-speed service for interconnecting LANs using variable-length packets that ride on ATM cells; and broadband Integrated Services Digital Network, a set of standard telephone services based on ATM switching and Synchronous Optical Network (SONET) standards, the latter of which define how broadband circuits are created.

So far, vendors have offered frame relay equipment that operates at speeds ranging from 64K to 2M bit/sec. However, frame rely has the potential to operate at speeds up to 45M bit/sec.

Cell relay operates most efficiently at speeds of T-1 or above. Experts predict ATM will typically be used at speeds of T-3 or greater. They say SMDS initially will operate in the T-1 to T-3 range and broadband ISDN will probably operate at SONET speeds, which begin at 51.8M bit/sec (accommodating T-3 transmissions) and climb into the gigabit range in increments of 51.8M bit/sec. Figure 1 on page 32 provides a comparison of frame relay, SMDS and broadband ISDN.

It will probably be difficult for users to navigate a migration path to one or more

(continued on page 32)

Herbst is a free-lance writer based in the Washington, D.C. area.

High-speed packet-switching technologies, such as frame relay and SMDS, are set to revolutionize the networks of the 21st century.

(continued from page 31)

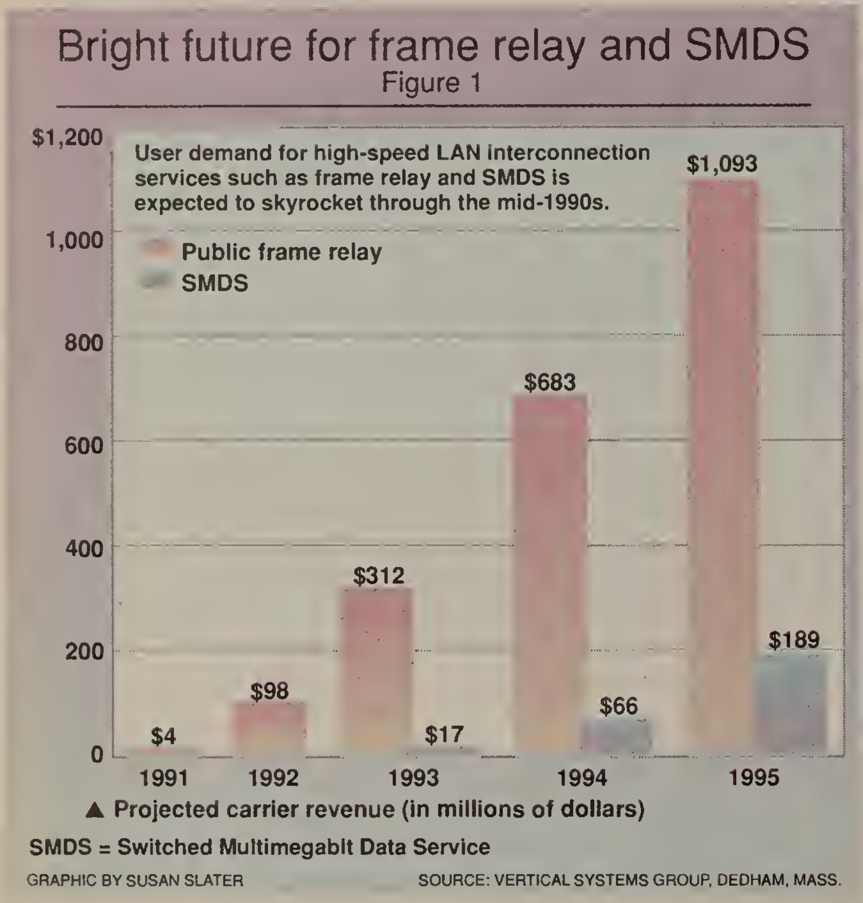
of the new packet technologies because the approaches are still evolving.

But by keeping abreast of the changes occurring in packet switching, users can better ensure that their networks are able to handle the demands of the future.

Framing the future

Frame relay has attracted a lot of attention because it is a far quicker, yet supposedly cost-effective, alternative to X.25 packet and circuit switching.

Just like X.25, frame relay specifies an interface between a LAN or data terminal and a public or private wide-area network.



Bright future for frame relay and SMDS
Figure 1

▲ Projected carrier revenue (in millions of dollars)

SMDS = Switched Multimegabit Data Service

GRAPHIC BY SUSAN SLATER SOURCE: VERTICAL SYSTEMS GROUP, DEDHAM, MASS.

But X.25 has a high processing overhead because it requires every switch in the network to perform error checking and correction at the data link and network layers as packets are passed from a sending device to a receiving device. This error correction was needed because X.25 was designed to cope with modem-driven transmissions across noise-prone copper circuits.

In this era of digital fiber-optic transmission, frame relay streamlines packet transmission by restricting error correction to sending and receiving devices.

Experts believe frame relay is well suited to transmitting the relatively high-speed bursty data traffic between today's LANs. The technology combines statistical multiplexing with the port-sharing features of X.25.

As a result, devices on Ethernet, token-ring, IBM Systems Network Architecture, X.25 and Digital Equipment Corp. DECnet networks can use frame relay with minimal data conversion because their variable-length packets are similar to frame relay's variable length packets.

Frame relay also uses a permanent virtual circuit (PVC) to pass packets between switches in a network as opposed to the virtual circuit used in X.25. A PVC establishes the path all packets in a single transmission take through the network, thus keeping all packets in order. But a sending node must have one defined PVC for every other receiving node in the network, a setup similar to that of a logical leased line.

A virtual circuit enables packets in a single transmission to take different routes, thus forcing the receiving switch to reorder packets before forwarding them to the receiving device.

In the future, frame relay will also use a switched virtual circuit (SVC) to allow sending devices to transmit data and the address of a receiver to a network switch. The switch will then find the path to the receiver, in much the same way a dial-up call is completed today. This eliminates the need to define a path from a sending device to all other receivers.

Because of their simplicity, PVCs are used in early frame relay implementations such as Tulsa, Okla.-based WilTel's WilPak service, says Rosemary Cochran, principal at Vertical Systems Group, a Dedham, Mass., consulting firm.

Work on SVC and other frame relay standards is proceeding swiftly, helping to allay user fears about the stability of the technology and compatibility between vendors' frame relay-based switches, routers and bridges.

Last fall, a consortium of four vendors — Cisco Systems, Inc., DEC, Northern Telecom, Inc. and StrataCom, Inc. — agreed on a specification for implementing frame relay that includes a local management interface (LMI) specification. LMI is a method of exchanging status information between a user device, such as a router, and the network.

LMI also includes a congestion control mechanism that keeps one switch from flooding another with more packets than it can process. This prevents packets from being dropped.

The initial agreement on LMI gave momentum to establishing an industrywide frame relay implementation based on emerging international standards.

The consortium's efforts were a forerunner to the Frame Relay Forum, a group of more than 50 telecommunications vendors developing a standard frame relay implementation.

"Basically, every player in the WAN and LAN internetworking industry is joining the forum," says Thomas Jones, chairman of the Frame Relay Forum's steering committee and vice-president of marketing for Herndon, Va.-based Netrix Corp.

RBHCs embrace frame relay

Until recently, many users, equipment vendors and regional Bell holding companies considered frame relay a short-term solution that would soon be replaced by SMDS. But frame relay has come on strong enough for at least the carriers to change their stance.

"Frame relay will coexist at lower speeds with cell relay and ATM-based technologies [such as SMDS]," Jones predicts. "If you don't need to do a lot of networking at T-3 and above, there is little advantage to going to cell relay."

However, cell relay offers other advantages. Because it transports information in fixed-length cells, it is relatively easy to drop and insert data from a broadband pipe, whereas bundling and unbundling frame relay packets is unwieldy at speeds above T-3. Cell relay's fixed cell size also makes it more suitable than frame relay for transmitting voice and video, which require constant sampling.

The RBHCs, once exclusively tied to SMDS, are now considering making frame relay a service within SMDS.

Passing the availability test

For users concerned about the maturity of a packet-switching technology and its standards, frame relay provides an answer.

"The frame relay standard is pretty well sewn up," says Steve Simon, a senior telecommunications engineer with The Travelers Corp., an insurance firm in Hartford, Conn. "It looks like it's coming into its own."

The availability of frame relay equipment is also an important consideration for users. Most bridge and router vendors, such as Cisco and Proteon, Inc., say they will offer software upgrades that will make their products compatible with the frame relay protocol. These products are likely to hit the market before products supporting an SMDS interface, which vendors are also developing.

"One of the critical things in going with one technology or the other is determining what interfaces are available on [network interface devices such as routers and multiplexers]," Simon says. "If routers have frame relay and not SMDS, it certainly makes frame relay more attractive."

Network managers wanting to implement a private frame relay network have been able to purchase StrataCom's IPX Fast Packet T-1 multiplexer, which runs StrataCom's proprietary cell relay protocol and includes a frame relay interface.

The variable length of frame relay packets transmitted between IPX nodes means traffic delays will vary according to the size of the frames. This makes frame relay unsuitable for transmitting data that is intolerant of unpredictable delays, such as voice or video.

However, multiplexers such as Netrix's #1-ISS series of integrated switches can handle both needs, switching bursty data over packet paths and voice or video over circuits.

Alternatively, users can retrofit existing circuit- and packet-switched multiplexers with frame relay interfaces. The retrofit option can be implemented with software modifications and is less expensive than purchasing new switches.

For now, The Travelers has opted for retrofitting.

Work on frame relay standards is proceeding swiftly, allaying user fears.

▲▲▲

"We think the router technology will buy us some time, depending on [its] level of sophistication, especially in containing overhead," Simon says. "It will dictate how much time we have before we need to go to a new kind of packet-switch technology on the trunk side."

Making frame relay public

WilTel is the only carrier offering a frame relay service today. Several others plan to roll out services later this year. Consultants say these public frame relay services will be useful as a backup to dedicated frame relay networks or as the primary transport for firms that lack the volume to support private frame relay networks.

Users pass traffic to the nearest WilTel point of presence via full or fractional T-1 lines at 256K bit/sec or 1.0248M bit/sec. Users with 256K bit/sec access can obtain 64K or 128K bit/sec full-duplex frame relay service, while those with 1.0248M bit/sec can obtain 64K, 128K, 256K or 512K bit/sec full-duplex frame relay service.

Upcoming services have been announced by BT North America, Inc, Cable & Wireless Communications, Inc., CompuServe, Inc., Graphnet, Inc., InfoNet Services Corp., MCI Communications Corp. and Sprint Data Group. Some of these will be available later this year.

AT&T and most of the RBHCs are also studying the feasibility of offering frame relay services. In fact, Nynex Corp. will trial frame relay this summer, while Pacific Bell will test it by this fall.

A study just completed by Vertical Systems Group predicts revenues generated by public frame relay carriers will rocket from $4 million this year to $1.093 billion by 1995 (see Figure 2, page 43).

RBHCs continue SMDS work

Although the RBHCs no longer discount the importance of frame relay, they are moving full speed ahead on development of SMDS offerings that will provide dedicated access to a switched high-performance backbone designed to interconnect LANs within a single metropolitan area. More than 30 carriers and equipment vendors have formed the SMDS Interest Group, which is defining a standard SMDS implementation.

SMDS will provide users with an on-demand service that gives them access to other LANs in a metropolitan area via a single link to a carrier's SMDS switch. This should make WANs more manageable than private dedicated lines at a competitive price.

Because the interfaces for connecting devices to SMDS — like those linking devices to LANs — are at the media access control layer, the changes customers must make to routers, bridges and other equipment in order to connect to SMDS will be less complicated and expensive than installation of ISDN-specific equipment, such as telephones and terminal adapters.

The SMDS IEEE 802.6 cell relay interface standard specifies the same 53-byte cell size and format as the ATM standard being developed for broadband ISDN. While SMDS provides for transmission of data at SONET rates, the first version of the standard defines a data-only service at T-1 to T-3 speeds.

The IEEE 802.6 base standard also has partially defined provisions for voice and video transmission, and voice and video extensions are now being refined by the IEEE's 802.6 committee.

Work on these extensions is proceeding at the same pace as the CCITT's efforts to define broadband ISDN in an attempt to make the standards consistent, and both are expected to be completed within two years.

The RBHCs may incorporate a switched video and voice service

(continued on page 43)

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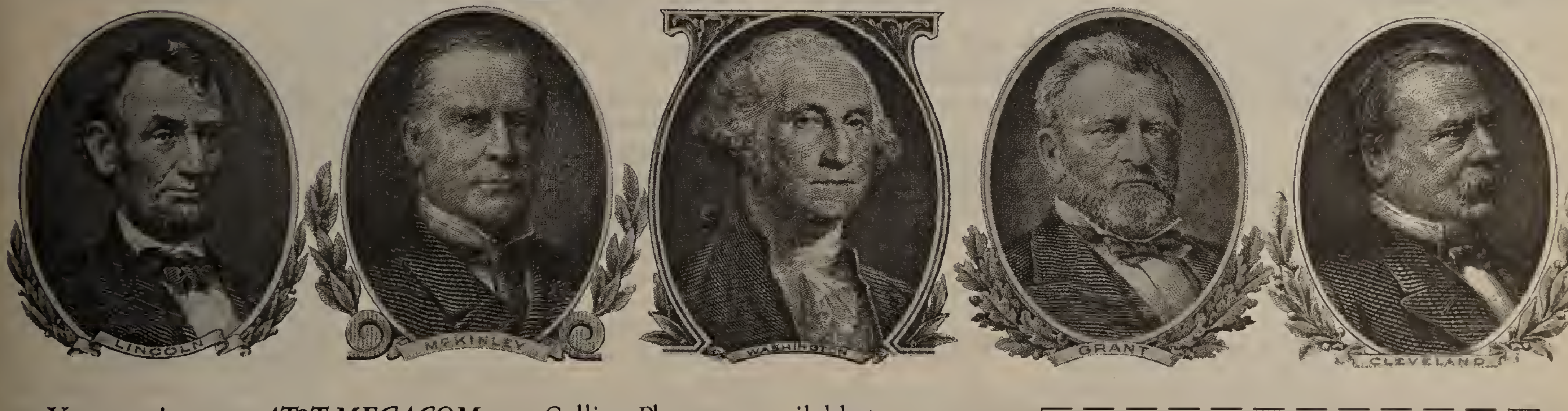

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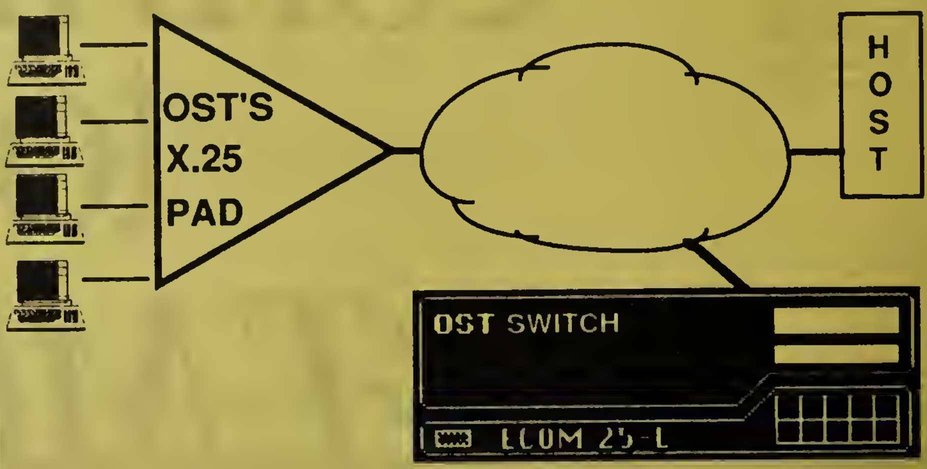

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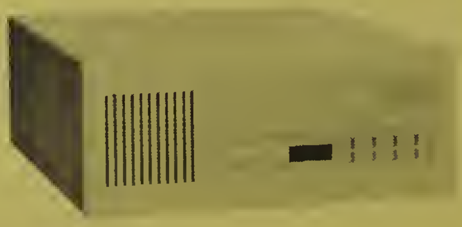

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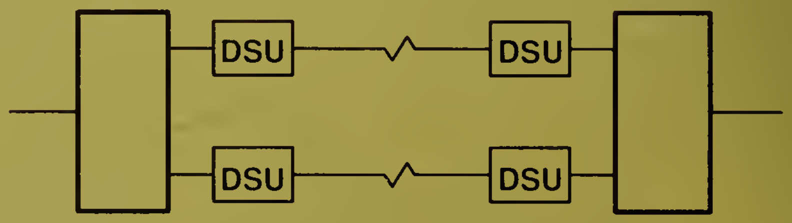

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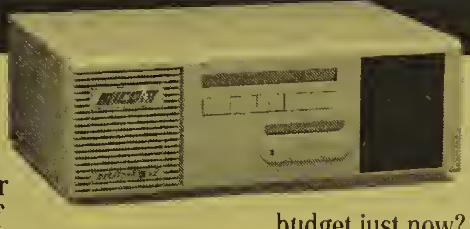

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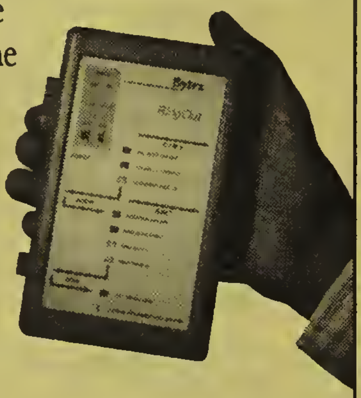

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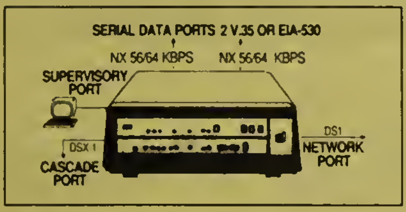

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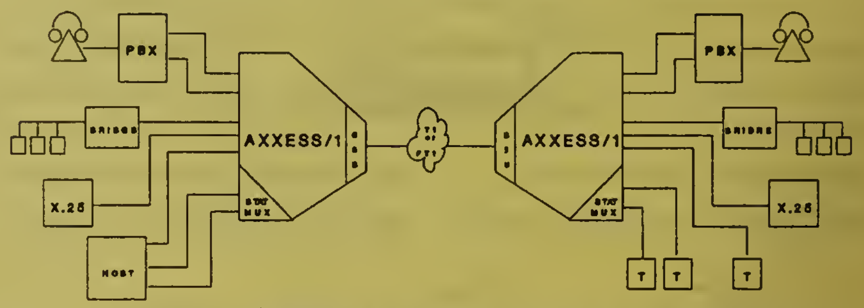

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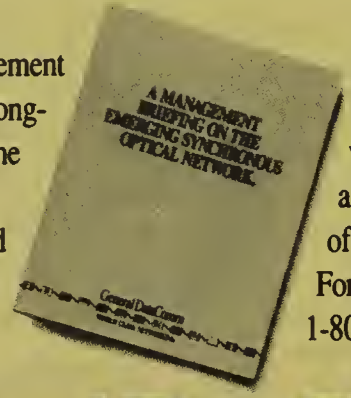
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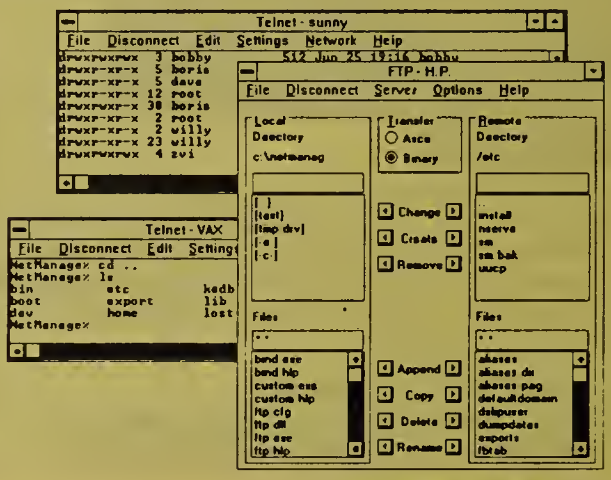

```
drwxrwxrwx  3 bobby        512 Jun 25 19:16 bobby
drwxr-xr-x  5 boris
drwxr-xr-x  5 dave
drwxr-xr-x 12 root
drwxrwxr-x 30 boris
drwxr-xr-x  2 root
drwxr-xr-x  2 willy
drwxr-xr-x 23 willy
drwxrwxrwx  4 zvi
```

```
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bin        etc        kedb
boot       export     lib
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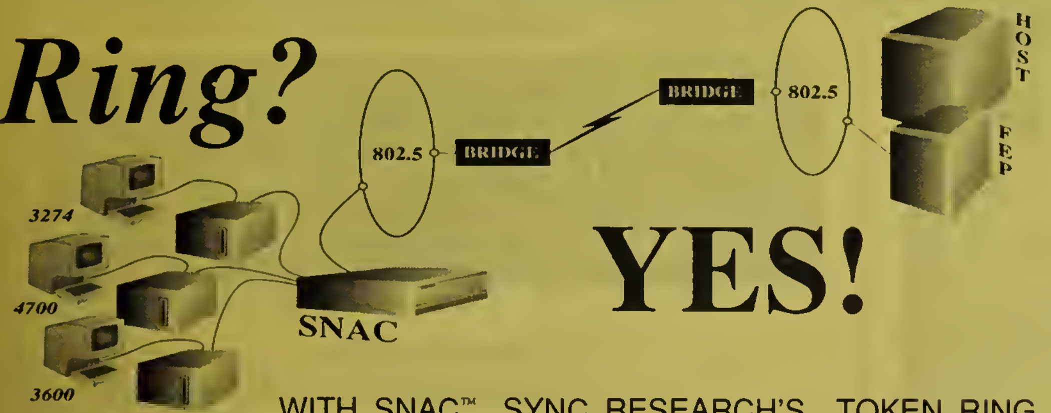

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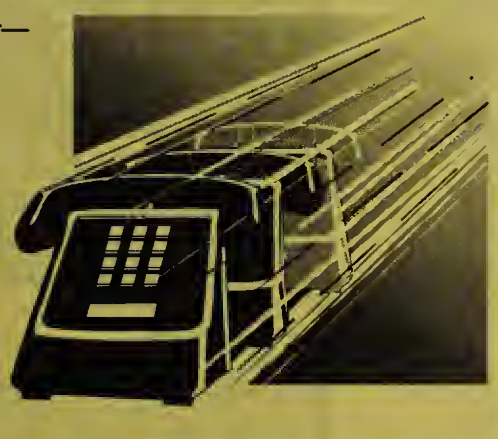

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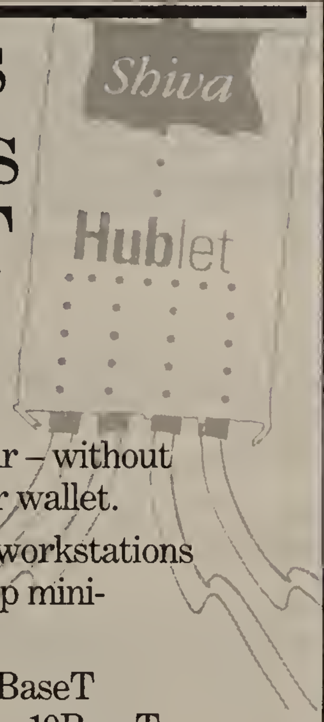

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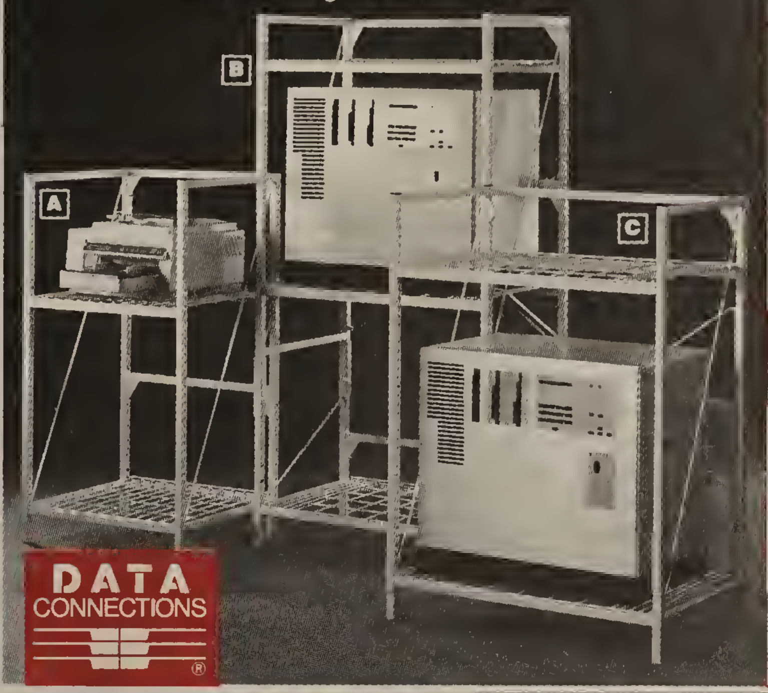

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(continued from page 32)

into SMDS networks, according to Larry Lang, a member of the technical staff at Bell Communications Research.

Comparing packet technologies

Figure 2

	Frame relay	Switched Multimegabit Data Service	Broadband ISDN
Applications	X.25, LAN/WAN internetworking, vendor-specific net architecture traffic	LAN/WAN internetworking, packet traffic	Bearer services
Access speeds	56K or 64K bit/sec, fractional T-1, 1.544M bit/sec	1.544M, 45M bit/sec	51.84M, 155.52M bit/sec
Connection type	Permanent virtual circuit, SVC	SVC	SVC
WAN transport	T-1, T-3	T-3, ATM	ATM
Call setup	Q.931	IEEE 802.6	Broadband ISDN
Suppliers	Customer premises equipment vendors, interexchange carriers, local exchange carriers, value-added network providers	Interexchange carriers, local exchange carriers, PTTs	Interexchange carriers, local exchange carriers, PTTs
Availability	Current	1993+	1995+

ATM = Asynchronous Transfer Mode
SVC = Switched virtual circuit

GRAPHIC BY SUSAN SLATER

SOURCE: VERTICAL SYSTEMS GROUP, DEDHAM, MASS.

With the exception of Southwestern Bell Corp., all of the RBHCs have announced plans to offer SMDS by next year.

Bell Atlantic Corp., the first RBHC to complete an SMDS trial this year, plans to offer SMDS in four local access and transport areas by year end. Baltimore, Philadelphia, Pittsburgh, Washington, D.C. and northern New Jersey are the top contenders for the initial service, according to a Bell Atlantic spokesman.

WilTel, Sprint Data Group and independent carrier GTE Corp. have also announced plans to provide SMDS. The fact that interexchange and independent carriers are eyeing SMDS and the RBHCs are joining the Frame Relay Forum indicates that "they all want to get a piece of everything," says Elaine Kearney, executive director of the Frame Relay Forum and the SMDS Interest Group. "They are all diversifying and broadening their services."

Several router companies including Cisco and Wellfleet Communications, Inc. have announced SMDS interfaces. A study just completed by Vertical Systems Group predicts SMDS will begin to generate significant revenues in 1993 (see Figure 2, this page).

SMDS service won't be available beyond a single metropolitan area until the RBHCs arrange interconnection between LATAs. Several RBHCs are discussing this project with interexchange carriers, but interconnection probably won't begin until 1993 or 1994 at the earliest, says Vertical Systems Group's Cochran. At that point, the SMDS service will begin to be converted to ATM technology.

Cochran and other experts say that after the interconnection phase for SMDS is completed in about 1994, SMDS service will be upgraded through the use of high-speed ATM-based switches that transmit ATM cells over circuits supporting SONET. This new service is being planned to support broadband ISDN services, such as voice, video and connection-oriented data, Lang says.

Frame relay vs. SMDS

Both frame relay and SMDS can convert and transmit packets from LANs using protocols such as Ethernet, token ring, SNA and X.25. But some experts believe frame relay has advantages because its packets are not subdivided into smaller cells as is the case with SMDS.

"[Frame relay] has the advantage that you are not force-fitting some applications into a specific frame size," Cochran says. "You may have more overhead or delay with cell relay if you are using many different transmission facilities or if you are using applications for which the fixed size of the cell is not optimal."

This technical difference may be significant, but most experts believe pricing and availability will be the major factors affecting the choice between frame relay and SMDS.

The Travelers plans to "play" the tariffs at first. "If my router supports frame relay on the private side and has been certified by a frame relay public carrier, that means if someone offers me a great tariff deal, I could change to the public network," says Robin Layland, an engineering consultant for The Travelers.

By being the first frame relay public carrier in the industry with a tariff, WilTel has set the precedent of offering flat-rate pricing based on the bandwidth and number of permanent virtual circuits assigned to a customer without regard to the distances involved.

This is a cross between the usual charge for a public packet network, generally based on the number of packets transmitted in a month, and a circuit-switched network, for which the charge is based on a combination of bandwidth and distance.

A mesh network with 128K bit/sec service on lines between New York and Los Angeles, New York and Chicago, and Houston and Los Angeles, and 64K bit/sec service between Chicago and Los Angeles, Chicago and Houston, and Houston and New York, will cost $4,877 per month, says Chris Heckart, WilTel's broadband services product manager.

SMDS carriers are likely to offer a choice of flat-rate or usage-based pricing, or some combination of the two.

Cochran says it will be difficult to determine the crossover between a flat per-month charge and a usage charge until the actual tariffs appear. But, as long as there is a low access charge and carriers give users some way of tracking their packet traffic, she believes some users will be eager to pay for the new packet services on a usage basis.

Work on frame relay, broadband ISDN, SMDS and ATM is ushering in a new era in packet switching. The resulting steady stream of new products and technology developments make it a challenge for users to find the best path for upward migration to the broadband networks of the future. ◻

Letters

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every circumstance is extremely difficult to determine.

Common Channel Signaling System 7 (CCS7) is the vehicle for controlling the domestic and international telecommunications network. But CCS7 also turns the network into a distributed process control system. It is the potential seed of communications outages. No carrier or user is safe, but risks can be reduced.

The electric utility industry had the same problem, as demonstrated by the Northeast power blackout of the mid-1960s. Fortunately, the North American power industry found ways to cope: It developed procedures to isolate the problem quickly by cutting off the troubled part of the electric grid.

The telecommunications industry must develop similar procedures. Industry executives and major users must not dismiss the problem as a mere bug, but instead should recognize its magnitude. Doing this will permit telecommunications to develop fully as a business tool. Otherwise, the result will be more national and international communications outages.

Ronald Brown
Communications consultant
Melrose, Mass.

Pro

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is only in charge of managing the system.

The network manager is the strategist fully in charge of determining how to use current and future technology in order to help the company fulfill its business objectives. On the other hand, the vendor's expertise lies in troubleshooting, keeping track of day-to-day operations, and making recommendations for equipment and service enhancements.

A comprehensive evaluation of the corporate income statement will reveal the variety of costs associated with your network operations and identify those expenses that can be managed more cost-effectively by outsourcing.

For the company with an outsourcing contract, costs for leased lines, data communications equipment and maintenance are consolidated under one budget item and managed at increased savings. Vendor partners can leverage greater discounts because of the large volumes of traffic and equipment they manage.

While in most instances outsourcing a company's data network does not result in a direct reduction of staff, it does result in an increase in productivity for those staff members previously assigned to the data network area.

With outsourcing, these staff members can devote more time to strategic applications, which results in greater competitiveness or perhaps greater cost efficiencies for the company's core business.

In addition, outsourcing stabilizes the size of the corporate staff and allows for more strategic network budgeting.

Another advantage of outsourcing your network operation is that doing so provides value-added services — including increased disaster recovery capabilities — especially to firms with limited resources. Options such as satellite, dial backup or switched digital services can be used to easily reroute your data traffic if the outsourcing vendor employs a virtual network feature.

Information and data communications networking are a strategic part of every firm's business plan. Finding an experienced net manager who understands an enterprisewide system built to meet specific goals is key to the success of most businesses.

Outsourcing can help such managers anticipate changes in advance, quickly adapt to surprises, effectively control crisis or disaster situations and substantially reduce capital expenditures on technology. ◻

Con

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sure privacy and confidentiality when you have given up control over security? And with health care and insurance applications, what about patient lists?

Promoters of outsourcing never spell out these fine nuances. To them, outsourcing simply translates into a big cost savings on personnel.

Let's take a scenario where a retail company is spending millions of dollars on its data communications department. The firm decides it can save money by outsourcing the applications, and it gets rid of the department.

After five years, or whenever the contract ends, the outsourcing company might decide to double the fee for its services, which may have deteriorated over the years. What does the retail company do now? It can pay the fee or look for alternatives, such as hiring the outsourcer's personnel or a completely new staff, or finding a new outsourcer, which might prove a difficult task if the user firm has special needs.

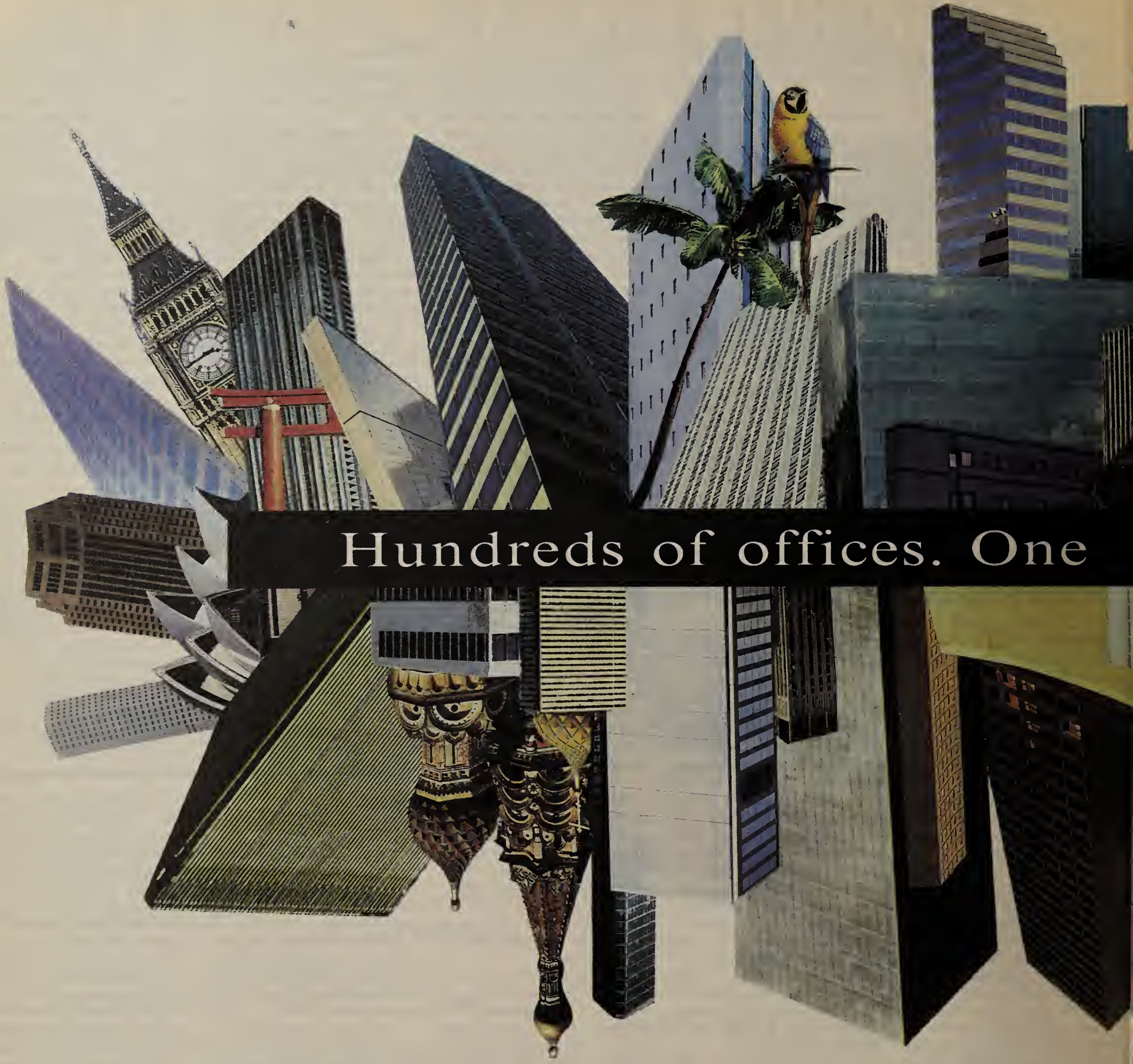
Hiring a full department and outfitting it with the latest equipment to manage the facility at this time will be virtually impossible unless the retail company can bring the outsourcing people on staff. However, this may not be the right solution if they were not providing good service in the first place. In addition, construction costs, special heating and air conditioning, and other data center considerations will have to be addressed.

Hiring new people will also prove very costly because the company will have to pay at least the market value of each position. Understandably, candidates will be apprehensive about the longevity of the newly created department. Because the company already has demonstrated that it will lay people off and outsource the operation, it might have to pay more than market value just to attract talent.

Paying a premium for good people has been the punishment of companies that were shortsighted in the past.

With all of these potential scenarios in mind, take some precautions before you plunge into totally outsourced solutions. Determine whether mission-critical applications should be entrusted to third parties. Confine outsourcing to those applications that have been justified with both short- and long-term criteria.

If everything makes sense, then proceed with outsourcing endeavors as you would with any other management procedure. Test it, evaluate it and make adjustments. Outsourcing, like every other so-called ultimate universal solution, has drawbacks and limitations. ◻



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THE POWER IS ON

Users gain via frame relay

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there are problems with frame relay as it exists today. They range from the need to alter multiplexer buffer parameters to accommodate broadcasts of configuration data to a general lack of support for congestion control.

Each of the users employed StrataCom, Inc. IPX fast packet multiplexers and Cisco Systems, Inc. routers. Motorola has a frame relay test bed consisting of four IPXs and four routers, split evenly between its Schaumburg, Ill., headquarters and a site in Phoenix, said Carl Megelich, manager of network architecture and strategy for the company.

Motorola conducted tests with packets that varied between 64K and 1,500K bits, transmitted in steady streams and random bursts. Megelich said the response time improvement was better than 50% as compared to routers without frame relay.

In addition, depending on the type of router traffic, the company was able to transmit between two and 10 times as much traffic on the same line using frame relay.

"The fast packet [multiplexer] lets us oversubscribe the backbone to begin with," he said. "With frame relay, we can now oversubscribe it even more. It's statistical multiplexing on top of statistical multiplexing."

Convex Computer has experienced similar bandwidth utilization gains with the hybrid public/private frame relay network it uses in production mode, said Coyne Gibson, MIS operations manager for the company in Richardson, Texas. Convex Computer has 10 sites using WilTel's WilPak frame relay service and another 28 on a private frame relay net ("Early user lauds frame relay service," *NW*, May 20).

Previously, bandwidth utilization on the T-1 lines supporting its routers was about 6% to 7% because they had to be configured to provide enough bandwidth for occasional bursts of data.

With frame relay, a single T-1 can be shared by multiple routers. Consequently, bandwidth utilization has shot up to 63%, Gibson said.

With the IPX, users select a minimum bandwidth amount for each frame relay channel, or permanent virtual circuit (PVC). Convex Computer uses a minimum of 256K bit/sec. Any time a PVC uses less than its allotted bandwidth, it earns bandwidth credits that it can later cash in, on demand, to access up to 1.026M bit/sec.

That helps users and carriers oversubscribe circuits. "You could oversubscribe a T-1 by 130% to 150% without noticing a delay problem," Gibson said.

Unlike Motorola, Convex Computer's response time has remained about the same. However, it's not an apples-to-apples comparison since the IPX supports a maximum frame relay channel of 1.026M bit/sec, whereas without frame relay, there is 1.536M bit/sec of useable T-1 bandwidth, Gibson said. So Convex Computer is getting the same response time using less bandwidth.

Megelich said variable response times are likely the result of different packet sizes. The benefit of frame relay is not as great with small packets because they experience limited delay through a router to begin with.

CSU has noted response time gains similar to those of Convex Computer in its private frame relay network, said Dave Reese, manager of the CSU engineering group in Los Alamitos, Calif.

With the addition of IPXs and frame relay, he reported a round-trip response time improvement of about 2 msec when shipping 100-byte packets over T-1s connecting three routers configured in a straight path ("CSU upgrades packet net to frame relay-based T-1 net," *NW*, July 15). The response time in a similar configuration using frame relay on four routers and IPXs was about the same as using only three routers directly connected by T-1s without frame relay, he said.

Reese said the relative performance gain will increase as networks get larger because, with frame relay PVCs, router traffic goes from its origin to destination without traveling through each intermediary router.

He said CSU had problems supporting Digital Equipment Corp.'s DECnet networks because frame relay routes weren't being broadcast to DECnet nodes. The problem resulted from an IPX buffer parameter, which was set too small to keep up with the DECnet route data the Cisco routers were sending. Consequently, configuration data was discarded. "This is not a parameter taught in the basic class from StrataCom," Reese said. Increasing the buffer size has apparently solved the problem.

Other users said similar problems could result because neither StrataCom nor Cisco are supporting the congestion bits detailed in the Local Management Interface specification the two companies helped devise to indicate when too much data is being sent through a frame relay interface.

Both companies promise to support the bits soon, but that's only half the battle, said Tom Nolle, president of CIMI Corp., a Vorhees, N.J., consultancy.

"A flow control indication doesn't necessarily translate into anything that the LAN or host protocols can act on," he said. A router that supported the congestion bits would still need a way to tell the computer sending data to slow down. That mechanism doesn't exist yet.

Without congestion control, users that oversubscribe a backbone risk having packets thrown away when the backbone becomes overloaded. In large nets, that risk is diminished because there is a statistically smaller chance of all users vying for the same bandwidth simultaneously. ◼

DOS still tops for local nets

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the vast majority of the market at 44% — almost double the number of OS/2 users.

"Traditional [networked] PC users that are not running high-end applications have little incentive to move off DOS," said Lee Doyle, an analyst at IDC. This is because they do not need multitasking and other features provided with other operating systems.

Much of the continuing success of DOS is based on the Windows graphical user interface, which runs on top of DOS.

Windows gives DOS-based workstations in network environments features and services that would otherwise only be available through an operating system upgrade.

The magic of Windows

First, Windows gives users multitasking-like capabilities. This allows users working on a spreadsheet, for example, to pull up a window to send electronic mail without exiting the application.

Windows also lets users access network devices more easily, such as with the click of a mouse on a picture of a printer, rather than having to type commands.

One other factor contributing to the operating system's success is the trend to standardize on DOS as the foundation for the various network operating systems that are adopted throughout an organization.

"Even in mixed environments, the desktop operating system can still be DOS, no matter what the network operating system [is]," said Bob Lem, an analyst at the Boston Systems Group, a Boston consultancy.

Novell, Inc.'s NetWare, Banyan Systems, Inc.'s VINES and Microsoft's LAN Manager run on DOS clients. So as more companies diversify, the network administrator will have the opportunity to keep a constant — DOS — throughout the network.

Overall, analysts agreed that DOS will, at some point, outlive its usefulness and be replaced by another operating system, either another desktop operating system or one that is a desktop/network combination. ◼

FCC to rule on slew of issues

continued from page 2

have arisen since divestiture.

The key question that the FCC is tackling now is whether AT&T has lost enough of its dominance in the long-distance industry to warrant giving it greater marketing freedom. In April 1990, the agency determined preliminarily that in the large business market, AT&T has forfeited enough market power to preclude it from harming competition.

Although AT&T has lost about 30 points of market share in the switched voice market, it still dominates other important markets such as 800 and international services, holding more than 80% of each of these markets.

The FCC has also been examining whether it is possible to lessen regulation of some services and not others. The agency is trying to decide whether AT&T should be able to bundle or discount competitive and less competitive services offered in a single package as it does under Tariffs 12 and 15.

The FCC will not take up the issue of Tariff 12 at the meeting this week because it needs more time to address specific legal questions laid out last year by an appeals court that overturned the commission's decision allowing Tariff 12. The Tariff 12 reinvestigation is likely to be completed in the fall.

The agency is, however, expected to take a final vote on Tariff 15, and sources say the FCC will probably reject it. Tariff 15, which allows AT&T to offer special discounts to customers that have received off-tariff offers from rivals, has been controversial since its debut in 1988.

Joel Lubin, director of federal government affairs at AT&T, conceded that it is probable the FCC will reject Tariff 15. However, he expects the FCC to give AT&T the ability to offer net services through contract so the carrier will be able to convert the defunct Tariff 15 deals into contract offers with little impact on users.

There is still a good deal of controversy about the rules under which AT&T can do business through contracts, sources said. But AT&T will apparently be able to draw up contracts for specific customers and file only a synopsis with the FCC, rather than a tariff that is generally available to all customers.

In addition, the FCC is likely to relax filing regulations for AT&T. The carrier currently must file tariffs for approval to offer its services on either a 14- or 45-day notice and provide cost data. The FCC proposed allowing AT&T to file on one day's notice, but sources said the final decision will probably give AT&T a five- or 14-day filing period and waive the requirement for cost data.

AT&T services eligible for streamlined filing include Software-Defined Network, Megacom, WATS, Pro America, private lines, Tariff 12 and Tariff 16.

The FCC will probably not be able to streamline regulation of 800 services until it resolves a related proceeding. Because 800 numbers are assigned to specific carriers, users cannot currently switch 800 providers and keep the same number.

The FCC is expected to rule this week on ways to push the local carriers to implement the data bases necessary to route 800 numbers to any carrier, enabling customers to move between carriers and retain the same 800 number.

In the fourth proceeding, the agency is expected to issue a proposal on how access charges will be structured.

Currently, a provision in the Modified Final Judgment mandates that access charges paid to the local carriers must be the same whether a long-distance carrier accesses the local switch directly or uses an intermediate tandem switch.

Because that provision expires on Sept. 1, the FCC is trying to determine how to handle access charges beyond that date. The FCC is likely to leave the current rules in place until it has more time to study the issue. ◼

NETWORK WORLD

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Users test nets' strategic worth

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nipulate it the same way. Moreover, companies may be reluctant to share data for competitive reasons.

Nevertheless, peer-to-peer benchmarking is taking hold, in part because with competition and communications costs on the rise, senior executives are increasingly holding network managers accountable for the way they manage valuable corporate resources.

"If net managers are going to start managing network operations more effectively, they have to know how they're doing compared to other companies," said Michael Cummins, director of the telecommunications management program at the University of Miami's graduate school of business. "But most don't have a clue how they measure up."

Xerox Corp. is one firm that takes benchmarking seriously.

The company's network group devotes two to three full-time staffers to benchmarking activities. These people seek out progressive firms with which Xerox can share performance data and exchange ideas. The group also compares the cost and quality of goods and services they receive from preferred suppliers ("Suppliers judged on quality and service," *NW*, June 24).

"We benchmark everything we do," said Fred Bolton, manager of telecommunications at Xerox in Webster, N.Y.

Xerox looks to exchange data with companies that deliver high-quality service at a low cost, he said. The firm then establishes those companies' performance levels as departmental goals. Bolton would not disclose with which companies Xerox has worked.

"We try to match their price/performance level using whatever means we can," Bolton said.

But he and other net managers admitted that comparing net data can be a problem because networks differ greatly, even among companies within the same industry, and traffic patterns, capacity requirements and geographical constraints typically vary from net to net.

Furthermore, companies may calculate costs and performance parameters differently. For example, it is important to know whether a company includes facilities costs, capital depreciation and salaries of network staffers in decentralized divisions when calculating network costs.

As a result, Xerox spends anywhere from two days to two weeks meeting with partners, depending on the amount of data they have available and whether it is suitable for comparison.

"You have to dig into the data in great detail to ensure that you are making valid comparisons," Bolton said.

To circumvent problems related to reconciling data and confidentiality issues, many companies interested in benchmarking initially take a less formal approach. Instead of focusing on metrics, they use the data as a springboard for informal discussions about strategy and management practices (see "Trust seen as key element in peer benchmark tests," this page).

While informal exchanges are a step in the right direction, network managers at companies such as Digital Equipment Corp., Florida Power & Light Co. (FPL) and Motorola, Inc. see the greatest value coming from establishing formal peer-to-peer benchmarking programs.

"We would like to find about six large companies with whom we can share ideas, strategies and performance data over a period of years," said Bob McCauley, quality manager for corporate telecommunications at DEC in Littleton, Mass.

McCauley emphasized that such a group would need to establish a set of common metrics that it could use to evaluate and compare net performance across all industries and types of networks.

Motorola's network department has been meeting informally with network groups from other firms bimonthly since it won the Malcolm Baldrige National Quality Award two years ago.

While these informal exchanges proved helpful, the department would now like to meet regularly in roundtable sessions with a few similar companies to analyze and compare performance data, according to Art Cipolla, director of telecommunications at Motorola in Schaumburg, Ill.

The University of Miami's Cummins has been kicking around ideas with net managers at FPL about forming a group of a dozen or so companies that would meet quarterly to swap data about network performance and management strategies.

"We want to determine whether we are providing reasonable cost and performance to our customers," said Everett Stonebraker, manager of telecommunications at FPL. ◼

Comparing net data can be a problem because networks differ greatly, even in the same industry.

▲▲▲

Trust seen as key element in peer benchmark tests

While benchmarking network performance with peer companies promises a variety of benefits, many network managers are hesitant to participate for fear of divulging sensitive information.

Earlier this year, Murray Fruchter, director of telecommunications at NBC, brought together six New York-based companies to explore the possibility of doing peer-to-peer benchmarking with the television network.

While the idea initially was to exchange operational information, Fruchter discovered that the companies were reluctant to disclose data such as staffing levels per number of circuits and terminals, equipment costs per network node and salary levels.

As a result, the companies opted for a less formal approach. The firms decided to contact one another if there was a specific area they wanted to explore, such as service-level agreements, strategies for doing moves, adds and changes, billing and local-area network administration.

While the companies now periodically discuss issues of mutual interest, Fruchter is optimistic that, in time, the companies will be willing to share more meaningful performance data.

"It's important to develop a relationship with companies first before you begin asking for data," Fruchter said. "Once you have established a level of trust, companies will be more comfortable sharing sensitive information."

— *Wayne Eckerson*

RBHCs receive green light

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has circulated a draft bill that would allow the RBHCs to manufacture equipment and impose regulatory safeguards in the event Greene allowed them into information services.

There is also a proceeding pending at the Federal Communications Commission to decide whether the RBHCs have to provide enhanced services, which would include most information services, through their telephone units or separate business units.

The FCC, which will likely be given oversight responsibilities by Congress to monitor the RBHCs' new information services operations, also supports the lifting of the restriction. AT&T, which strenuously opposes allowing the RBHCs to manufacture or provide interexchange service, was neutral on the ruling.

Brian Moir, counsel for the International Communications Association (ICA), said the user group is concerned about Greene's decision to lift the restriction. ICA does not oppose lifting any of the Consent Decree restrictions as long as there is either enough competition or safeguards to protect consumers, but Moir said neither of those are in place.

"The regulatory mechanism at the commission is not sufficient to handle the problems of today, much less the [Consent Decree]," Moir said.

In his order last week, Greene said it appeared to him that in mandating a review of his 1987 decision, the appeals court left him no choice but to allow the carriers to enter the information services market.

Need a certainty

In 1990, the appeals court overturned Greene's earlier decision, saying there would have to be a certainty, not just a likelihood, that the RBHCs would harm competition in the information services industry in order to keep the ban in place.

However, Greene said there were enough ambiguities in the instructions from the appeals court on how to conduct his review to leave him questioning whether he might have made the wrong decision.

"This court is following what appears to be the most plausible interpretations of the several critical Court of Appeals directions," Greene stated in his order.

"[But] it cannot be certain that its interpretation of the dispositive appellate directions is correct [and] it follows, of course, that this court cannot be certain of the correctness of its decision to remove the information services restriction from the [Consent] Decree."

Because Greene expects his decision to be appealed to the same court that ordered him to reconsider the issue, he ruled that the RBHCs won't be allowed to provide information services until all legal questions are resolved. ◼

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